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A Case of Secondary Small Pox, with references to some cases of a similar nature. By T. BATEMAN, M.D. F.L.S. Physician to the Public Dispensary, and to the Fever Institution.

[From the Medico-Chirurgical Transactions, vol. II.]

IT has long been observed by medical practitioners, that, after the constitution has undergone the ordinary influence of small pox, the individual is still liable to be *locally* affected by the variolous poison, whether introduced under the cuticle, by inoculation, or applied in continued contact to the undivided skin. Hence, on the one hand, some inoculators have been in the practice of repeatedly inoculating themselves, and raising a pustule on some part of their own skin, in order to preserve a constant supply of the *virus* for the purposes of their profession; and, on the other, no phenomenon is more common, than an eruption of variolous pustules round the nipples and on the breasts of women, during an attack of small pox in the infants whom they suckle. In some cases, a moderate degree of feverishness and general indisposition is observed to accompany these secondary eruptions. It is, however, almost universally believed, that the constitutional effects of the variolous poison having been once produced, nothing beyond this local

influence can result from its application hereafter. But many exceptions to this general truth are recorded, upon undeniable evidence, and might be multiplied, it is probable, were all cases of the kind accurately noted, and none of a questionable nature slurred over or explained away, under the presumption of the impossibility of a second occurrence of small pox. Two instances of this recurrence of the disease have come under our notice, at the Public Dispensary, within the last three years, although small pox rarely claims the attention of physicians in those institutions, unless in a few severe and aggravated cases. The instance which I have now to relate, is of recent occurrence.

Frances Bird, aged twenty-five years, residing at No. 3, Bowl and Pin alley, Chancery lane, nursed with great assiduity an infant, nine months old, during the progress of confluent small pox, of which it died on the 15th day of November, 1809. For two or three days previous to the death of the infant, she felt herself languid and feverish; and on the evening of the 15th she became still more indisposed, complaining of considerable pain in the back, pains about the breast and stomach, thirst, and loss of appetite, which were followed by vomiting. These febrile symptoms continued; and on the 17th an eruption began to appear on the skin.* On Tuesday, the 21st of November (the fifth day of the eruption) she called upon me at home, supported by her mother, and stated the extreme indisposition, under which she laboured, as an apology for not deferring her application until the following day, at the regular hour of attendance at the Dispensary. Her countenance was exceedingly heavy and languid; the eyes were dull, and slightly suffused with redness; the tongue was furred, white, and rather clammy; the pulse frequent and feeble; and the skin hot and dry, with a sensation of soreness and stiffness in it. She complained of great inability of exertion, and of much general uneasiness. There were about fifteen spots on

* This circumstance is worthy of particular observation. In those instances of the recurrence of small pox in a local degree, which are common in nurses, the feverishness, if any take place, appears *subsequent* to the eruption, of which it is symptomatic: but, in this case, the fever *preceded* the eruption, as in the ordinary progress of the Exanthemata.

the face, approaching to the pustular character, some of them rather horny and tuberculated, but others less so; and surrounded by a slightly red circle; two or three of them, indeed, on the left cheek, were surrounded by considerable redness and some hardness and elevation of the skin: there were three or four on the eyelids, accompanied by some redness of the tarsi, especially of the right eye, and two on the side of the nose: there were also several other pustules on the breast, and, as she stated, on the body and thighs, to the number of about fifty.

This eruption was obviously of a variolous character, and had been so considered by her mother and friends. But the mother expressed her surprize at the occurrence, since she affirmed that the patient had undergone the casual small pox in her infancy, in so severe a degree that her life was then despaired of;—that the medical attendant had called it "the *putrid* small pox;"—and that she had been blind six days: all of which was corroborated by the *numerous pits* with which her face was thickly marked.

At my request, Dr. Willan saw her this day, and confirmed the opinion of the variolous nature of the eruption: he obtained a drawing of the pustules, as they appeared on the face, which he has kindly allowed me to lay before the society.

Wednesday, Nov. 22. (Sixth day.) I visited her, in company with my friend and colleague, Dr. Laird. We found the pustules somewhat increased in elevation, and the redness surrounding them also augmented. The countenance was still dull and heavy, and the eyes rather suffused. The pulse 110; the tongue white, and rather dry; the skin slightly hot; no appetite; some thirst. A laxative, prescribed yesterday, had operated. There were several pustules on the left mamma, four or five immediately surrounding the nipple, the child having been nourished from that breast.

Thursday, Nov. 23. (Seventh day.)—Doctors Laird and Birkbeck visited her with me to-day. The elevation of the pustules is nearly as yesterday; the surrounding redness is almost gone: those about the nipple are beginning to dry. She still complains of being feverish, and without appetite for food; but there is less heaviness, and no redness of the eyes, and

much less languor of the countenance. The tongue is still white, but moist; the pulse still quick. On the suggestion of Dr. Birkbeck, one of the pustules was opened, and the fluid found to be purulent. Bowels much relaxed by the diaphoretic mixture, which she has taken.

Friday, Nov. 24. (Eighth day.)—She walked to Dr. Willan's house, in Bloomsbury Square this morning; found herself ill and fatigued after her return, and was lying on the bed when I called upon her. She complained of languor and headache; the pulse was upwards of 100; and the skin rather hot; the tongue as yesterday. The pustules on the face are full, and of a deeper yellow colour; those on the eye-lids somewhat sunk and horny. I armed a lancet from one of those on the cheek.

Saturday, Nov. 25. (Ninth day.)—She is free from indisposition, and the pustules generally are drying, and of a brown colour:—those on the cheek, which were surrounded by the largest areolæ, still contain pus; and one on the neck, and another on the thigh, are large, elevated, and inflamed, assuming the appearance of small boils, and containing a considerable quantity of purulent matter.

Monday, Nov. 27. (Eleventh day.)—All the pustules are dried, and a little accuminated, brown scab is formed upon each of them.

With the lancet, which was charged with *virus* on the eighth day of the eruption, the arm of a young woman was inoculated by Mr. Wachsel, in the Small Pox Hospital; while *virus*, taken from a patient in the hospital, was inserted into the other arm. Full and regular pustules appeared on both arms, at the same time, and went through the same course, no difference between the two being observable. Had the disease of my patient been *chicken pox*, one of the eruptions would have been suspended, until the other had gone through its course.

This case afforded another fact, which must not be omitted to be mentioned. My patient was the mother of three children; one of whom was seven years of age, the other three and a half. Both these had undergone vaccination, at the age of eleven months respectively; i. e. the one six years preceding this occurrence; the other nearly three: and although they

both resided in the same apartment, during the progress of the fatal small pox in the infant, they remained altogether free from complaint; the cow-pock having, in this instance, effected a security, which the small pox itself had failed to produce.

The other case, to which I have alluded, occurred under the observation of my colleague, Dr. Laird, in the summer of 1806. Being absent from town at that time, I did not see the patient; and regret that my friend only published the following brief notice of it. His words are these:

"I avail myself of this opportunity to advert to another fact in the history of small pox. The agitation of the vaccine question has, I think, clearly ascertained that one of our medical dogmas admits of some limitation. It has been proved that the same individual may be twice susceptible of the specific operation of the variolous poison. I conceive the following to be a case in point. During the course of last summer, one of my patients at the Public Dispensary, a boy thirteen years of age, had the natural small pox very severely. It was regular in its progress and duration: and yet, when a year old, he had slept in the same bed with his grandmother, while she laboured under this disease, which proved fatal to her; and at that period he was the subject of an eruption, accompanied with fever, and considered not only by his friends, but by a respectable surgeon who attended him, to be genuine small pox."*

The importance of attaining to accuracy in regard to the question involved in the preceding history, being, under the present circumstances, extremely great, I may perhaps be allowed to trespass farther on the time of the society, while I notice a few similar facts, which stand on record. To attempt to impugn a doctrine, which is at least as old as the Arabian†

* See Edin. Medical and Surgical Journal, vol. iii. p. 155.

† Even the Arabians admitted that, when the first *fermentation* of small pox did not expel the whole of the *menstrual* humours from the body, subsequent *ebullitions* would take place, and the small pox would occur a second time, sometimes even a third, but very rarely a fourth time. See Diemerbroeck, de Variolis et Morbillis. Cap. iii.

schools, and has appeared to be confirmed by the experience of every succeeding age, would perhaps be considered as the height of temerity, if not of folly; but when we reflect, that, until a very recent period, the phenomena of diseases of the eruptive class were very imperfectly discriminated,—that down to the time of Diemerbroeck and even later, the small pox and measles were deemed varieties only of the same disease*—that the small pox and chicken pox were not properly distinguished until near the close of the eighteenth century,—and that numerous authors have successively described examples of the recurrence of small pox;†—the attempt might appear to be less extravagant. This very inaccuracy, however, of the older writers renders their description of the recurrence of small pox extremely questionable: and it cannot be doubted, that many of the cases described by them, and others, referred to by Burserius,‡ were instances of chicken pox; and that others, in which the disease has been said to recur five, or seven times,§ or still more frequently, were either altogether fabulous, or that different eruptions were mistaken for small pox. We cannot, at least, put the authority, on which such histories are related, in competition with the testimony of a Dimsdale or a Woodville, who are said to have discredited the recurrence of small pox, except in the *local* form before mentioned.

With respect to Dr. Woodville, however, this statement is not correct. Mr. Ring informs us, on the authority of Mr. Ridout, who attended a child, affected by a second attack of small pox, along with Dr. Woodville, that Dr. W. admitted it to be, "the second instance he had seen, in which there could

* Loc. cit. cap. xiii. De Morbillis. "Differunt a variolis accidentaliter; seu secundùm magis et minus."

† See *Van der Wiel*, Observationes Medico-anatomicæ. Cent. II. 42.—*Hagendorn*, Hist. Medico-physicæ. Cent. II. Obs. 60.—*Journal des Savans*, Tom. XI. p. 417. 1759.—*De Haen*, Rat. Med. P. IX. Cap. VII, &c.—*Diemerbroeck*, loc. cit.—*Forestus*, Lib. VI. Obs. 43, &c.

‡ Institut. Medicinæ, vol. II. p. 157.

§ See *Borelli*, Histor. Medico-physicæ. Cent. III. Obs. 10.—*Paullina*, Observat. Med. Cent. III. Obs. 27.—Ephemerides Natur. Curiosor. Dec. II. Ann. IV. Obs. 29.

be no doubt of the fact."* And Dr. Woodville once stated to me, in answer to a question respecting his experience on this point, that not a year elapsed, in which one or more children were not brought to the Small Pox Hospital, labouring under small pox, but who were said by the parents to have previously gone through the disease. Dr. Woodville admits, too, in his History of Inoculation, (page 217), that a fact, stated by Dr. Deering, of the recurrence of small pox in a boy (a son of Dr. Croft), who had previously suffered the disease in a confluent form, had not been contradicted. Dr. Adams, his successor at the Small Pox Hospital, allows that examples of such recurrence, in our own days, are both numerous and well authenticated.†

Instances of a second infection, communicated, like the case which I have detailed, by nursing patients under the disease, are indeed exceedingly numerous. Mr. Ring has collected, with great industry, a variety of such examples, which appear to be well established both by the circumstances and by respectable authority. In five cases of this sort, females, who had suffered severely from the small pox, when young, received the disease a second time, with considerable constitutional indisposition; in one of them upwards of one hundred pustules appeared; in another three hundred; in a third, ten or twelve; and in a fourth, "an eruption all over the body."‡ Similar cases are mentioned by other authors.§

There are many examples on record, both in our own time, and in the age immediately preceding, when the small pox was well understood, in which decided, severe, and even fatal small pox have been observed a second time in the same individual, from a more casual infection. One of the most striking is the case of Mr. Langford, related in the 4th vol. of the

* See Med. and Phys. Journal, vol. xiv. p. 406.

† See Med. and Phys. Journal, vol. xiv. p. 196.—Also, Answers to all Objections against Vaccination.

‡ See Med. and Phys. Journal, vol. xiv. p. 402.—Vol. xv. p. 434.

§ Ibid. vol. xii. p. 318. by Hensler, &c. Mr. Moore mentions a lady of his acquaintance, who was infected, in this secondary way, with slight indisposition, six successive times when suckling her children. See his Reply to the Antivaccinists.

Memoirs of the Medical Society of London. This person's countenance was "remarkably pitted and seamed" by a former malignant small pox, "so as to attract the notice of all who saw him;" yet at the age of fifty, he was attacked again with confluent small pox, of which he died; having infected five of the family, one of whom also died.

In the case of Miss Price, published by Dr. Adams, the small pox, produced by inoculation in her infancy, had left some visible marks on the face; yet she lately had a full eruption of distinct casual small pox. She had had the chicken pox when a child.*

A writer in the *Journal des Savans*,† has described a similar recurrence of small pox, in a young woman who was marked by a previous attack of the disease. He was unable to account for it, until he found that she had slept in sheets, used by a child labouring under small pox. The writer seems to have been aware of the "*variole volante*," (doubtless the chicken pox) occasionally occurring after small pox, with a slight fever of twenty-four hours duration.

De Haen relates several instances, in his different works, of the recurrence of small pox; among which are the following.

The daughter of a Florentine nobleman was inoculated in 1761; but, although the arm exhibited the usual appearances, the pustules on other parts were few, and dried up in a few days; insomuch that the family were doubtful of her security; but their doubts were removed by the opinion of those experienced inoculators, Tozzetti and Condamine. Her brothers, however, were inoculated in 1763, when she received the infection from them, and had a copious eruption of distinct small pox.‡

De Haen likewise relates, that a student of law at Helmstadt, about twenty years of age, took the small pox in the casual way; his face was swelled, and the pustules were numerous, and surrounded by a red circle; a secondary fever took place on the sixth day; the pustules became confluent in

* Answers to all Objections, &c. App. II. p. 31.

† Tom. IX. for the year 1759, page 417.

‡ Ratio Medendi, P. IX. Cap. VII.

a few places, in which pits were left. He went to pursue his studies at Frankfort, where he died, three years afterwards, of the confiuent small pox; in which the eruption was very copious, depressed, and no redness surrounded it.*

The same author also describes the cases of the daughter and two sons of Dr. Krapf, Archiater to the archduke Leopold, from his own diary; all of whom appear to have gone through two very decided attacks of small pox, in the spring and summer of the same year.

In another publication† he has detailed other instances, which appear to be equally unequivocal; three of these occurred in a noble family, in Vienna, and were attended by De Haen and Molinari. The circumstances in one of the three are related as follows:

"Filia autem natu major, verno tempore anni 1760, variolas alteras passa est. Testari id possum, cum sæpius illam, una cum Clariss. *Molinari* inviserim. Discretæ quidem multis in locis erant, at quoque in multis cohærentes, confertissimæ adeo, ut in facie, brachiis, cruribus, vix daretur, sine papulis, locus. Gravis utique fuit morbus. Salivatio incepit mox ab eruptione, continuavit ad undecimam morbi diem, adeo copiosa, ut, mensurâ de industria captâ, sesquilibræ vas quotidie expleret; post undecimum vero sensim decrescens, tandem ad decimum quartum cessavit. Hanc autem aliquando imminutam, pectusque ac guttur angustantem, continuatis mane ac sero balneis brachiorum et crurum, potu multo, injectione in fauces, gargarismis, et auctiore imprimis mane ac vespere opio, feliciter semper restituimus, venam secare nondum coacti.

"Igitur hæc nobilissima virgo, quæ ante elapsos duos cum dimidio annos, graves adeo variolas passa erat, nunc iterum et copiosissimas, et molestissimas, et multo diuturnoque ptyalismo sociatas, habuit."

* Loc. cit.

† Ad Perillust. *B. L. Tralles*, Epistolam Apologit. Responsio, p. 11. See also De Haen's Quæstiones super Methodo Inoculandi Variolas, &c. Likewise *Hagendorn*, Historiæ Medico-physicæ, Cent. II. Obs. 60. and *Sarcone*, Epist. ad Hallerum V. in both of which, instances of a fatal recurrence of small pox are related.

Besides the cases above stated and referred to, numerous others are on record, to which I have not found access: and some treatises have been written expressly upon the subject, which are probably not to be found in this country. Such are *Gerardi*, Ritomo di Vaiuolo, Padua, 1776.—Loeber, Seuschreiben von dem Wieder-kommen der Pocken, &c. Erfurth, 1767.—Medicus et Petit, Deux Lettres sur la rechute de la contagion de la Petite Verole, Manheim, 1767,—which I have not seen.

Enough, however, has probably been stated, to render the occasional recurrence of small pox unquestionable; and at least, to make us pause, before we reject the evidence which may come before us, on the subject; and to lead us to a careful and accurate examination, where appearances, tending to invalidate the received dogmas, occur. It will not, therefore, be necessary to recapitulate the examples adduced, to the number of sixty or seventy, by Mr. Ring,* many of which, although founded upon the testimony of unprofessional persons, are very circumstantially detailed;—nor to quote the authority of Pallas, who, I am informed, mentions that he was detained, when on his travels, by his daughter falling ill of small pox, which she had before suffered;—nor to repeat the statements of the second attack of the disease in the person of Louis XV. of France, in whom a former occurrence from inoculation had been publicly announced;—neither shall I recur to the cases, of which we have only oral evidence, and several of which were mentioned in this society on a former evening. These latter statements receive a higher degree of probability from the well established evidence of the former cases; and the whole cannot but lead us to the opinion, that, upon a close and faithful investigation of facts, it will be found that the small pox occasionally occurs a second time, or oftener, in every degree of severity, from the few local pustules, unaccompanied by constitutional indisposition, which are occasioned by much contact, up to the most general and malignant disease.

* See his Treatise on Cow Pox, and various numbers of the Medical and Physical Journal, especially in vols. xii. xiv. and xv.

Experiments on the Urine discharged in Diabetes Mellitus, with Remarks on that Disease. By WILLIAM HENRY, M.D. F.R.S. Physician to the Infirmary, Dispensary, and Lunatic Hospital at Manchester.

[From the Medico-Chirurgical Transactions, vol. II.]

IN the analysis of the urine voided in diabetes, a few circumstances appear not to have been determined with the degree of precision which the subject admits, and which it is desirable to attain; though calculated, perhaps, rather to have an influence on the pathology of the disease, than on its medical treatment. In consequence of the recent occurrence of two cases of diabetes mellitus under my own care, and of other opportunities for which I am indebted to my colleagues* in the Manchester Infirmary, I have lately been enabled to examine several specimens of this variety of morbid urine. The results, I am well aware, do not present any facts of great novelty or importance. Yet they may perhaps not be unworthy of being laid before the Society; since they contribute to furnish tests of the existence of the disease, and of the degree in which it is affected by diet or remedies, which are more easily applicable than those hitherto employed. Without entering, therefore, at large into the chemical history of diabetic urine, I shall limit myself to the description of a few of its properties, to which I have particularly directed my attention.

I. *Of the specific gravity of Diabetic Urine, and the proportion of its solid contents.*

The specific gravity of the urine, discharged in diabetes mellitus, has been left unnoticed by some of the best writers on its chemical history, as Cruickshank, Nicolas and Gueudeville, and Thenard. In about ten cases where I have had an opportunity of determining this property, it has never fallen short of 1028 nor exceeded 1040; 1000 parts of water at 60° Fah^{t}. being taken as the standard. This appears to agree very nearly with the experience of the few writers, who have no-

* Drs. Ferriar, Bardsley, Holme, and Mitchell.

ticed its relative weight, and especially of Dr. Bostock,* Mr. Dalton,† and Dr. Watt.‡ The circumstance of specific gravity I consider as a most useful test of the existence of diabetes in doubtful cases; and, when the disease is unequivocal, taken along with the actual quantity discharged, it furnishes a good criterion of the degree of morbid action. Healthy urine I have never found, even in its most concocted state (viz. when voided on first rising in the morning), and when an average has been taken of that of several different persons, to have a higher specific gravity than 1020. In the course of the day, also, it falls greatly below that number, while the specific gravity of diabetic urine, though subject to a little variation, never changes during the same day, to any thing near the same amount. It may be objected, perhaps, to the employment of this test, that it requires more familiarity with the method of taking specific gravities, than falls to the lot of the greater part of medical practitioners. By means, however, of an hydrometer, which is well known to practical chemists, and which may readily be procured at a small expense, the specific gravity of the urine may be taken, in a few moments, and with the greatest accuracy, by a person wholly unaccustomed to experiments of this kind.§

Respecting the proportion of solid contents, obtainable from diabetic urine, little agreement, as might be expected, is to be found among authors; for besides that the amount actually varies, it must necessarily depend greatly on the degree to which the evaporation is carried. In Captain Meredith's case, described by Mr. Cruickshank,‖ it appears at the maximum, to have constituted rather more than $\frac{1}{12}$ of the urine; Dr. Bos-

* Med. Memoirs VI. 241.

† Dr. Bardsley's Med. Reports, p. 161.

‡ Cases of Diabetes, &c. p. 79.

§ The hydrometer best adapted to this purpose is made by Mr. W. Twaddell, of Glasgow. To avoid the inconvenient length of the stem, it is divided into four parts; but it is No. I. only of the series, that is required for determining the specific gravity of urine. To reduce the degrees of this instrument to the common standard, the rule is to multiply by 5 and then to add 1000. Thus, 6° of the hydrometer denote a specific gravity of 1030; for $6 \times 5 + 1000 = 1030$.

‖ In Rollo on Diabetes, 2d edition, p. 19.

tock, in a case which he has related in the Memoirs of the Medical Society of London,* obtained $\frac{1}{9}$ of a thick syrup; Nicolas and Gueudeville $\frac{1}{14}$ of a mass resembling coarse sugar;† and Thenard from $\frac{1}{17}$ to $\frac{1}{30}$.‡ By this process, it will always be found difficult to obtain an exact comparison between the urine of different persons, or of the same patient at different stages of the disease. It appeared to me, therefore, desirable to connect, by a set of careful experiments, the quantity of extractive matter with the more certain character of specific gravity. From such a series of experiments, I have constructed the following table, which exhibits at one view, the quantity of solid matter in diabetic urine of different specific gravities between 1050 and 1020. It will be easy, however, to extend the scale, by the rule of proportion, to any case in which the urine may be found to have a specific gravity above the former, or below the latter, of those two numbers. In the experiments, which furnished the data of the table, the urine was evaporated by a steam heat, till it ceased to lose weight, and till it left an extract, which became quite solid on cooling.

* Vol. vi. page 240.

† Ann. de Chim. xliv. 59.

‡ Ann. de Chim. lix. 47.

TABLE,

Shewing the quantity of solid extract in diabetic urine of different specific gravities.

Specific Gravity of the Urine.		Quantity of solid extract in a wine pint, in grains and tenths.	Quantity of solid extract in a wine pint, in			
In degrees and tenths of Twaddel's Hydrometer.	Compared with 1000 parts of water at 60° F.		oz.	dr.	scr.	grs.
4.	1020	382.4		6	1	2
4.2	1021	401.6		6	2	1
4.4	1022	420.8		7	0	0
4.6	1023	440.		7	1	0
4.8	1024	459.2		7	1	19
5.	1025	478.4		7	2	18
5.2	1026	497.6	1	0	0	17
5.4	1027	516.8	1	0	1	16
5.6	1028	536.	1	0	2	16
5.8	1029	555.2	1	1	0	15
6.	1030	574.4	1	1	1	14
6.2	1031	593.6	1	1	2	13
6.4	1032	612.8	1	2	0	12
6.6	1033	632.	1	2	1	12
6.8	1034	651.2	1	2	2	11
7.	1035	670.4	1	3	0	10
7.2	1036	689.6	1	3	1	9
7.4	1037	708.8	1	3	2	8
7.6	1038	728.	1	4	0	8
7.8	1039	747.2	1	4	1	7
8.	1040	766.4	1	4	2	6
8.4	1042	804.8	1	5	1	4
8.8	1044	843.2	1	6	0	3
9.2	1046	881.6	1	6	2	1
9.6	1048	920.	1	7	1	0
10.	1050	958.4	1	7	2	18

II. *On the quantity of Urea contained in diabetic urine, with some inferences respecting the pathology of the disease.*

Another circumstance respecting diabetic urine, which has not hitherto been sufficiently determined, is the presence or absence of that substance, the secretion of which is the peculiar office of the kidney, and which gives to healthy urine its characteristic properties. Cruickshank,* Dalton,† Fourcroy,‡ Nicolas and Gueudeville,§ and Thenard,‖ have been led to conclude that urea is not contained, in any proportion whatsoever, in diabetic urine. Dr. Bostock, in the paper already quoted,¶ expresses a different opinion; but that able philosopher was afterwards induced, by further experiments, to adopt the general belief of the complete absence of urea.**

The test which has hitherto been employed to decide this point, is the addition of nitric acid to the extract of urine dissolved in a small quantity of water. When urea is present, a copious precipitation is immediately produced of bright pearly scales, resembling very nearly in their appearance the acid of borax. And though this test appears to have been considered as somewhat equivocal, from its affording a crystallized substance by its action on sugar, as well as on urea,†† yet a little attention will obviate all uncertainty from this source. The change effected by nitric acid on urea, takes place at common temperatures; and, when it does not happen immediately, is entirely prevented by heating the mixture, in consequence of the decomposition of a part of the acid by the urea, and the formation of volatile alkali, which unites with the undecomposed acid and forms nitrate of ammonia. On the other hand, crystals of oxalic acid are never produced, until after the application of a high temperature. The shape of these crystals also is strikingly different from that of the crystals of nitrate of urea; the latter being readily discriminated, by their flat scaly form and pearly lustre, from the crystals of oxalic acid, even when the figure of the latter is modified, as sometimes

* Rollo on Diabetes *passim.* † Bardsley's Med. Reports, p. 161.
‡ Système des Connais. Chim. 4to v. 480. § Ann. de Chim. XLIV. 69.
‖ Ann. de Chim. LIX. 48. ¶ p. 260. ** Bardsley's Reports, p. 174.
†† Bostock in Med. Mem. VI. 251.

happens by the presence of other substances. In some cases, where doubts appear to have existed as to the nature of the product resulting from the action of nitric acid on the extract of urine, I suspect that it has been a mixture of oxalic acid and nitrate of ammonia, both of which have probably been generated, in consequence of the urine having contained urea as well as sugar; a combination not unusual in the less perfect forms of the disease.

In decided cases of diabetes mellitus, it has invariably happened, within my own experience as well as that of other persons, that the nitric acid, applied to the extract of the urine, has failed to give any indications of the presence of urea. There appeared to me, however, reason to suspect that the action of that acid on the urea might possibly be prevented, by its agency on the greater proportional mass of sugar. To determine this point, nitric acid was added to artificial mixtures of the extract from diabetic and natural urine,* with the following results.

Extract from 1 measure diabetic with 1 of natural urine.	The whole presently rendered solid by the abundant precipitation of nitrate of urea.
Do. from 2 measures diabetic to 1 natural urine.	In the course of a few minutes, a copious precipitation of scales.
Do. from 4 measures diabetic to 1 natural urine.	No immediate precipitation; but it commenced in half an hour and gradually increased.
Do. from 6 diabetic to 1 natural urine.	A very sparing precipitate of pearly scales, but not till after 24 hours.
Do. from 8 diabetic to 1 natural urine.	No scales in forty-eight hours.

From these experiments, it may be inferred that urea can no longer be made apparent by nitric acid, in the extract from any mixture of diabetic and natural urine, when the former exceeds the latter in a greater proportion than that of six to one; or, as nearly as I can estimate from other experiments, when the solid urea is less than $\frac{1}{20}$th of the weight of the mixed extract. There is one property however of this substance, originally pointed out by Fourcroy and Vauquelin, which en-

* The diabetic urine was that of S. Brookes, whose case was described by Dr. Ferriar in his Medical Histories and Reflections, 2d edit. I. 135. It had the specific gravity 1033. The natural urine was the portion first voided in the morning by a man in strong health, and had the specific gravity 1019.

ables us to detect urea, even when present in such minute quantities, as to escape discovery by the nitric acid. Amidst the great variety of animal products, this appears to be the only one which is decomposed, when in a state of solution, by the temperature of boiling water. At this low degree of heat, its elements, held together by a balance of affinities which is easily disturbed, arrange themselves in a new order; ammonia and carbonic acid are generated; and carbonate of ammonia is composed, equivalent in weight to about two thirds that of the urea.* It is in the fluid, therefore, condensed during the evaporation of diabetic urine, that we are to look for traces of the existence of urea; and in this fluid I have invariably found a sufficient quantity of carbonate of ammonia to restore the colour of reddened litmus paper, and to precipitate muriate of lime. When the distillation is carried so far, as to reduce the residuum to charcoal, the last products are strongly acid, in consequence of the production of the pyromucous acid from the decomposed sugar. Even in these latter products, however, a portion of ammonia exists, and may be obtained in a separate form, by first saturating the liquid with pure potash, and then submittting it to a second distillation. The condensed fluid will invariably be found to contain volatile alkali, though often, it must be acknowledged, in very minute quantity. It is on the ammonia, which comes over *early* in the distillation of diabetic urine, that I am disposed chiefly to insist, as establishing the presence of urea; because we are unacquainted with

* Healthy urine, it is well known, is acid when first voided, and reddens vegetable blue colours; owing, as Thenard asserts, (Ann. de Chim. LIX. 270) to its containing acetic acid. After being heated, however, for a short time, the liquor becomes alkaline, in consequence of the production of ammonia. When fresh made urine is distilled, carbonate of ammonia comes over, though in small proportions, till almost the whole of the fluid is evaporated. It is then produced in great quantity, and lines the neck of the retort and the receiver with a solid incrustation. The quantity of carbonate of ammonia which I have thus obtained from a wine gallon of fresh and concocted urine, has varied from two to three ounces. Its production may chiefly be referred to the urea, which is equally decomposed by heat and by putrefaction. I have been informed, indeed, by persons who distil urine for manufacturing purposes, that little, if any, increase of volatile alkali is gained by previously allowing the urine to become putrid.

any other animal substance, which can give origin to the volatile alkali under such circumstances.

Another proof of the existence of some portion of urea in diabetic urine, may, in many instances, be obtained by a careful observation of the phenomena attending its spontaneous decomposition. At a temperature of 60° Fah^t^. diabetic urine passes rapidly to the acetous state. But if the succession of changes be carefully watched, it will be found that there is a point at which, before it becomes acid, it exhibits, to sufficiently delicate tests, distinctly alkaline properties.

In the account of these experiments, I have not thought it necessary to state the proportion of urea in the fluid submitted to them, because the ingredients of the urine, whether in a healthy or a morbid condition, will scarcely ever be found to have the same proportion to each other. The deficiency of urea in diabetes, however, may be stated as being very considerable. In those cases where I have attempted to estimate it, from the quantity of ammonia evolved by the destructive distillation of the urine, the urea has not appeared to exceed from $\frac{1}{40}$ to $\frac{1}{60}$ the quantity contained in an equal measure of concocted healthy urine. One specimen of diabetic extract, with which I was favoured by Dr. Bardsley, approached so nearly to perfect whiteness, that there appeared to me little reason to expect any evidence of its containing urea. Yet, even in the product of the distillation of this extract, after being rectified with the addition of potash, ammonia was found. On distilling, also, a portion of the urine itself, the condensed liquor gave manifest traces of carbonate of ammonia. This urine, however, contained a far less proportion of urea than I had ever before ascertained; not exceeding, as nearly as I could estimate, $\frac{1}{80}$ of the natural quantity. Making every allowance, then, on account of the increased flow of urine, it will appear that the quantity of urea discharged by persons labouring under diabetes, in any diurnal interval, falls considerably short of the quantity voided in a state of health.

In the examination of diabetic urine, when the disease has not been completely formed, it has occurred to me to find, along with saccharine matter, sufficient urea to give a distinct precipitation on adding nitric acid to the dissolved extract. This

is a state of the urine, also, which is often produced by the exclusive use of animal diet. In such cases, I have endeavoured to determine the proportions of the urea and saccharine matter to each other, by the following process: a portion of the extract was first decomposed by destructive distillation; and the product then redistilled with the addition of carbonate of potash. The condensed liquid was next saturated by diluted sulphuric acid of known specific gravity; and from the quantity of this acid, which was required, I inferred that of the solid ammoniacal carbonate, every two parts of which were assumed to indicate three of urea. This process I believe to be much more accurate than the treatment of such a mixed extract with nitric acid; because nitrate of ammonia will be formed, and will be mixed with the crystals of oxalic acid, thus rendering their apparent greater than their real quantity. The precision, however, which is attainable in this way, can only be required in experiments of research. For all practical purposes, the use of the hydrometer, and the application of the test of nitric acid to the extract, will afford a sufficient measure of the degree, in which the urine deviates from the healthy standard.

Two hypotheses have been framed to account for the principal phenomena of diabetes. According to the one, the seat of the disease is solely in the organs of assimilation. But it has been satisfactorily proved, that saccharine matter does not exist ready formed in the serum of diabetic blood.* Until, therefore, it can be shewn that there is a direct communication between the digestive organs and the kidneys or bladder, capable of conveying sugar from the former to the latter without its passing through the general circulation, the theory must be modified by assuming that the blood, which reaches the kidneys, contains *the elements* of sugar, and is deficient in those of urea. To this theory, however, which takes for granted the healthy state of the kidneys, it may be urged as an objection, that it supposes those glands to have a natural tendency to secrete su-

* Nicolas and Gueudeville, Ann. de Ch. XLIV. 69. Dr. Wollaston Phil. Mag. XXXVII. 79; and my own experiments, the result of which is stated in Dr. Ferriar's Medical Histories, 2d edit. i. 146. The same conclusion is established also, by experiments which I have very lately made.

gar, whenever its elements are presented to them. But this is a point which can scarcely be conceded; for besides that the secretion of urea is known to go on under the exclusive use of vegetable food, such a function in the kidneys would be inconsistent with that wise adaptation of parts, which devotes every organ to some specific purpose essential to the healthy state of the animal economy. It appears therefore to be necessary to a just pathology of the disease, that some morbid condition of the kidneys should be admitted, though of a kind which has not yet been explained by anatomical investigation.

At the same time, it is probable that the assimilatory organs are, also, disordered; for the kidneys, though their function is perverted,* so as to render them instruments for forming sugar, still retain in part, their power of producing urea, when they are furnished with fit materials. This may be deduced from the known influence of animal diet, in diminishing the quantity of urine in diabetes, and in restoring to it that peculiar substance which characterizes healthy urine. In the cases which have fallen under my own treatment, as well as in those which have been shown to me by my medical friends, these have been almost invariable consequences.† But it has not always followed, with equal certainty, as might have been expected from the testimony of some writers, that the disease in such instances has been cured. In the first case which I had an opportunity of treating, the urine in eight days was reduced from 14 or 16 pints in the 24 hours to 6 pints. Its specific gravity, at the close of that interval, remained the same; but the extract afforded an abundant scaly precipitate with nitric acid. Notwithstanding this change, the strength of the patient, already reduced to an extreme degree by the duration of the disease, sunk so rapidly that I acquiesced in his wish to return

* Dr. Rollo, in his valuable work on Diabetes, (p. 418. 427.) expresses an opinion that the kidneys are merely *separating but not secreting* organs, adapted to remove excrementitious or unassimilated matter from the system. They appear to me, however, to partake of the office of secretion equally with every other gland in the body; for there is as marked a difference between urea and any of the proximate principles of the blood, as between the latter fluid and the bile, or any other secreted substance.

† One exception only has occurred to me, which I have stated in Dr. Ferriar's Med. Hist. i. 144.

home to a distant part of the country, and to die in the midst of his own family. In this case (and similar ones, I believe, are not uncommon*) the kidneys must have regained much of their healthy action, while the general disease remained unsubdued. It should appear, therefore, that neither derangement of the organs of assimilation, nor morbid action of the kidneys, is of itself sufficient to account for the disease: and that both causes are probably concerned in its production†.

III. *Of the remaining ingredients of diabetic urine.*

With regard to the action of chemical tests on diabetic urine, and to the nature and proportion of the *saline substances* which it contains, I have nothing to add to the accurate reports, which have already been given by Nicolas and Gueudeville, and by Dr. Bostock. With their experiments my own for the most part coincide, and tend to establish the conclusion, that the different salts exist in diabetic urine, almost in the same proportion to each other as in the healthy state, but that they fall considerably short of the same absolute quantity.

The nature and amount of the *primary animal fluids* (as they have been termed by Dr. Bostock) which are contained in diabetic urine, can scarcely, I apprehend, be determined, till we are in possession of tests, which, while they act as precipi-

* See in particular, Dr. Lubbock's valuable essay in the 5th vol. of the London Medical and Physical Journal.

† An opportunity has lately occurred to me of trying the plan of treatment in diabetes, which has been recommended, with so strong a body of evidence in its favour, by Dr. Watt of Glasgow. The patient (a female aged 34) had laboured under the disease more than twelve months, and was then voiding from 12 to 18 pints of urine daily, which had the specific gravity, 1037, and gave no traces of urea, except by distillation. Though she was much emaciated, yet her muscular strength did not appear to me to be so far diminished as to forbid the practice of bloodletting. Between the 28th of December and the 14th of January, she was bled four times, to the extent of twelve or fourteen ounces each time. She was put also, on a gentle course of mercury, which after some time slightly affected the mouth; and she was laid under no particular restriction as to diet. I did not find, however, that the smallest impression was made either upon the state of the symptoms, the quantity of urine, or its chemical composition; and I, therefore, discontinued the practice. From a solitary case of so hopeless a disease as diabetes, it would be unfair to deduce a condemnation of this or any other plan of treatment.

tants of those fluids, shall have no agency on saline substances. In the present state of this branch of animal chemistry, it unfortunately happens that all the tests, with which we are acquainted, afford nothing more than equivocal appearances, when applied to the urine. Acetate of lead for example, is not only precipitated by animal mucus, but by the muriatic and phosphoric salts, which abound in that fluid.

It has been disputed whether the *saccharine matter*, existing in diabetic urine, be identical or not with vegetable sugar. According to Cruickshank,* both substances, if due allowance be made for the saline ingredients of diabetic extract, yield, by the action of nitric acid, very nearly the same proportion of crystals of oxalic acid. Nicolas and Gueudeville and Thenard have obtained, also, by the fermentation of diabetic extract, very nearly the same weight of alcohol, as would result from an equal weight of vegetable sugar†. These circumstances appear to me to be decisive, with respect to the close similarity between the two substances. On the other hand, it has been asserted, that the saccharine matter of diabetic urine cannot, like vegetable sugar, be brought to assume a crystallized form. The absence of this property, however, is not invariable; for I have had an opportunity of observing distinct crystals of sugar, in a portion of diabetic syrup long exposed to the atmosphere. A mouldy scum formed on its surface, which was repeatedly removed and reproduced. In this way much of the animalized matter was doubtless separated; and the residuary syrup afforded regular crystals by spontaneous evaporation. Some slight difference may possibly exist between animal and vegetable sugar, but one depending on those minute differences in the proportion of elements, or in their mode of combination, which cannot be appreciated, till the analysis of the products of organized bodies has attained far greater refinement and accuracy, than belong to it in its present state.

Manchester, Feb. 1811.

* Rollo on Diabetes, 2d. edit. p. 429.

† Ann. de Chim. XLIV. & LIX.

[TRANSLATED FOR THE ECLECTIC REPERTORY.]

Memoir on the influence of the Temperature of the Air on the chemical phenomena of Respiration. Read at the Institute, May 11, 1812, by Mr. DELAROCHE.

[From the Journal de Physique, de Chimie et d'Histoire Naturelle.]

ABOUT two years ago, I had the honour to read to the class, a memoir, on the power possessed by animals, of producing cold when exposed to a high degree of heat. After having shown, that this power depends solely on the evaporation of the matter of perspiration, whether from the lungs or skin, I remarked, that notwithstanding the suppression of this evaporation, the excess of temperature of the animals over that of the surrounding air was trifling, when the temperature of the air rose to thirty-five or forty degrees of centegrad. therm., pointing out the fact as a difficulty in the chemical theory of animal heat. We cannot perceive at the first glance, why, when every known cause of refrigeration has ceased, the heat disengaged by respiration should not raise the temperature of the animals as much above that of the surrounding air, whether the latter be high or low. With the view of determining the nature of the doubts which this, and analogous facts already published, might oppose to the theory of animal heat, it is necessary to determine whether the chemical phenomena of respiration are as obvious in high as in low temperatures. Moreover, after the discussion of this subject, when my memoir was read before the assembly, some of the learned characters then present, and particularly Mr. Laplace invited me to investigate the subject. Mr. Berthollet, with his habitual kindness, offered me every assistance in the inquiries, which I immediately undertook. The results which I then obtained, I mean now to lay before the class. This was not done earlier, because I proposed to subjoin them to a work I had begun on animal heat, and its proximate cause; a work, which a variety of circumstances have prevented my continuing, at least for the present.

These inquiries are not entirely new. Crawford has published, in his work on animal heat, a few experiments made on Guinea pigs, when it would appear, that the absorption of oxygen diminishes rapidly in proportion as the temperature of the external air rises; but these experiments are not sufficiently numerous, nor conducted with sufficient care to command confidence.

Spallanzani has proved, by a great number of experiments, that in cold-blooded animals, the activity of the chemical phenomena of respiration increases with the temperature of the surrounding air. To the best of my knowledge, he did not extend his inquiries to warm-blooded animals, though he appears to have been of opinion, that the same occurred in these as in cold-blooded animals.

In 1806, I published the result of some experiments on this subject, made in conjunction with my friend Dr. Berger; from which I inferred, that if heat exerts any influence on the activity of the chemical phenomena of respiration, it is, sometimes to increase, and sometimes to diminish it;—but, not being satisfied as to their accuracy, and not having repeated them often enough, I shall merely describe them without drawing any decided conclusions.

The experiments, of which I am going to offer the results,* were made by placing the animals, whose respiration I wished to examine, in the manometers lent me by Mr. Berthollet; and by examining the alteration which the air contained in these instruments had undergone, after the animals had continued in it a longer or shorter time. It is unnecessary to give a particular description of the manometers, a very clear one having been given by Mr. Berthollet, in the first volume of the Memoirs of the Society of Arcueil. It will be sufficient to state, that they are wide-mouthed glass jars, closed hermetically by a brass plate screwed on. This plate has two openings, one for the passage of a barometer; in the other, a stop cock is fixed, by which a portion of the air may be drawn off, being replaced by an equal volume of water. This operation may be repeated

* The first were made at Arcueil, in the presence and with the assistance of M. Bernard. As they were not so accurate as those I afterwards made, I shall not give the results.

at pleasure, during any period of the experiment. A thermometer hung in the center of the manometer indicates the temperature of the contained gas, and the elevation of the mercury in the barometer gives the degree of pressure to which this gas is subjected. By these means we can ascertain, with great ease, if the quantity of gas has varied during the experiment.

In all the experiments made on warm blooded animals, I employed the same manometer Mr. Berthollet used in those of the same kind, which he published in the second volume of the Memoirs of the Society of Arcueil, the receiver of which was a glass globe, containing 28 litres. The capacity of that I used for frogs did not exceed 1.36 litre. I placed these manometers in a cool room, and having allowed them time to acquire the temperature of the surrounding atmosphere, I introduced the animals, whose respiration I wished to examine, and inclosed them, leaving the cock open. Two minutes after, I also closed the cock, at the same time noting the height of the mercury in the thermometer and barometer. I left them in this state for about an hour; at the end of which time, (having again examined the height of the mercury in the barometer and thermometer), I drew off and analyzed a portion of the gas.* I then withdrew the animal, which had not remained long enough to suffer from the alteration of the gas. The next day, or the day after, I repeated the experiment, placing the manometer in a stove-room, more or less heated, allowing the animal to remain the same length of time.† By these comparative experiments, which I repeated on a great number of animals, I could easily determine the influence which external heat exerted on the chemical phenomena of respiration. The results will be found in the following table.

* In this analysis I employed the eudiometer of Volta.

I separated the carbonic acid by repeated washings with lime water.

† I have frequently inverted the order of the experiments, beginning with those made in the stove-room.

Number of the Experiments.	Name of the Animals.	Duration of the experiment expressed in minutes.	Temperature of the manometer during the experiment.	Quantity of gas remaining at the end of the experiment, when reduced to its original temperature and pressure.	Analysis of the gas. Azote.	Oxygen.	Carbonic acid.	Oxygen absorbed.	Oxygen absorbed, reduced to the pressure of 76 centim. of mercury, to the heat of melting ice, and to extreme dryness.	Carbonic acid produced, reduced to the pressure of 76 centim. of mercury to the heat of melting ice, and to extreme dryness.
1	Rabbit . .	60′	14,3	0,9923	0,7991	0,1516	0,0415	0,0584	0,0539	0,0383
			28,2	1,0029	0,8031	0,1544	0,0415	0,0544	0,0464	0,0355
2	Rabbit . .	65,5	11,9	0,9904	0,7931	0,1459	0,0514	0,0641	0,0596	0,0478
			37,4	0,9896	0,7917	0,1448	0,0541	0,0652	0,0536	0,0437
3	Rabbit . .	58,5	11,1	0,9988	0,8015	0,1505	0,0488	0,0595	0,0565	0,0463
			26,6	1,0000	0,7950	0,1515	0,0535	0,0585	0,0513	0,0469
4	Rabbit . .	70,3	11,0	0,9963	0,8039	0,1369	0,0555	0,0731	0,0670	0,0509
			27,8	0,9869	0,7934	0,1413	0,0522	0,0687	0,0592	0,0450
5	2 Guin. pigs	68,5	14,0	0,9938	0,7989	0,1536	0,0413	0,0564	0,0519	0,0380
			26,0	0,9986	0,7984	0,1565	0,0437	0,0535	0,0462	0,0385
6	2 Guin. pigs	60,	10,7	0,9944	0,8043	0,1547	0,0354	0,0553	0,0513	0,0330
			35,5	1,0000	0,7974	0,1876	0,0450	0,0542	0,0431	0,0571
7	2 Guin. pigs	76,5	11,4	0,9944	0,7979	0,1392	0,0573	0,0708	0,0654	0,0529
			35,4	0,9915	0,7982	0,1403	0,0530	0,0697	0,0570	0,0433
8	2 Guin. pigs	54,5	4,2	0,9928	0,8040	0,1374	0,0514	0,0726	0,0707	0,0501
			41,1	1,0076	0,8069	0,1546	0,0462	0,0554	0,0485	0,0372
9	Cat	63,0	10,3	0,8 61	0,8039	0,1511	0,0311	0,0589	0,0557	0,0289
			32,7	1,0077	0,8101	0,1622	0,0354	0,0478	0,0391	0,0289
10	Cat	65,0	11,4	0,9931	0,8016	0,1435	0,0480	0,0665	0,0606	0,0437
			30,0	0,9905	0,7955	0,1521	0,0429	0,0579	0,0493	0,0365
11	Pidgeon . .	88,	12,5	0,9951	0,7882	0,1794	0,0276	0,0306	0,0283	0,0256
			24,8	0,9958	0,7952	0,1831	0,0175	0,0269	0,0236	0,0151
12	Pidgeon . .	129,3	8,7	0,9957	0,8020	0,1622	0,0315	0,0478	0,0444	0,292
			26,0	0,9923	0,7950	0,1620	0,0353	0,0480	0,0406	0,299
13	Pidgeon . .	96,	8,7	1,0000	0,7927	0,1772	0,0301	0,0328	0,0307	0,0285
			28,2	0,9935	0,7889	0,1737	0,0309	0,0363	0,0308	0,0262
14	Pidgeon . .	93,5	2,8	0,9938	0,8046	0,1587	0,0205	0,0413	0,0409	0,203
			38,2	0,9945	0,7924	0,1739	0,0282	0,0361	0,0295	0,230
15	9 Frogs . .	201,0	6,3	1,0044	0,8180	0,1727	0,137	0,0373	0,0363	0,0131
			27,4	0,9800	0,8282	0,0482	0,1036	0,1618	0,0425	0,0912
16	9 Frogs . .	150,	7,6	0,9822	0,7899	0,1692	0,0231	0,0408	0,0390	0,0221
			26,8	0,9890	0,8188	0,1297	0,0401	0,0803	0,0703	0,0353

I need not enter into an explanation of the four first columns in this table. I will, however, remark, that though I have supposed the time that the animal remained in the manometer, to have been the same in all the comparative experiments; yet, there was always a very slight difference, but this has been obviated in the calculation; the effects produced in one case being reduced to what would have occurred if the time had been precisely the same with the duration of the first part of the experiments.

The fifth column indicates the quantities of gas remaining at the close of the experiment, reduced to the volume they would have occupied, if the state of the barometer and thermometer had not varied, but remained the same as in the first instance. I have assumed, as an unit, the quantity of gas contained in the manometer in the first instance.

The sixth, seventh and eighth columns indicate the quantities of each elementary gas contained in the manometer, being fractions of that unit; in the ninth are expressed the quantities of oxygen absorbed.

The principal object of these experiments being to ascertain the comparative quantities of oxygen absorbed, and carbonic acid produced, by animals confined in the manometer, it was necessary, in the different experiments, to reduce them to a common unit; which was done by taking as such the whole quantity of each gas the manometer could have contained, if filled when the mercury in the barometer stood at 76 centimeters, at the temperature of melting ice, and the gases previously dried. The eighth and ninth columns contain the quantities thus reduced.*

I shall now point out the principal conclusions to be drawn from the results exhibited in the foregoing table.

If they are considered distinctly and independent of any comparison with each other, they will be found to agree pretty nearly with those experiments made by Mr. Berthollet, already referred to. There was, for the most part, a slight diminution of the volume of air contained in the manometer. It is true,

* In the note at the end of the Memoir is introduced an example of the calculation of the numbers as contained in this table.

that this diminution was not uniform, and generally, in proportion to the duration of the experiment, much smaller than was observed by Mr. Berthollet; but this may be easily explained from the manner in which my experiments were conducted. For, instead of determining the height of the thermometer placed in the center of the manometer at the time I introduced the animal, I allowed an interval of two minutes, that the thermometer might acquire the temperature of the gas contained in the manometer.

In every instance there was less carbonic acid produced than oxygen absorbed. Whence I have supposed, with Mr. Berthollet, that there was a production of azote; but there may be some error as regards this, for the analysis of the gas being confined to the portions contained in the top of the manometer, might not indicate the real proportion of carbonic acid.

If a comparison be made between the results of the experiments made on the same animal under similar circumstances, but at a different temperature, it will be seen, that in almost all the experiments made on warm-blooded animals, the quantity of oxygen absorbed, after making allowance for the reduction of the gas to the same temperature, has been rather greater in a low than an elevated temperature. This difference, however, has been very small; and in three experiments, entirely wanting, or rather the order inverted. But this is not the case if the numbers are corrected by a reference to the state of the thermometer and barometer. The difference observed between the results, when the animal was exposed to an elevated temperature, and in those when exposed to a low temperature, become more considerable. It is wanting only in one experiment, and appears, in general, to be greater in proportion as the difference of temperature is increased. It, however, has never exceeded one third of the oxygen absorbed, in low temperatures. Taking, on the one hand, all the experiments made in warm temperatures, and on the other those made in a cold, which gives a mean difference of temperature of 21 centrg. we obtain for the mean quantity of oxygen absorbed in the first case, 0,04415, and for that absorbed in the second, 0,05265. The quantities are nearly as five to six, and their difference

appears much less than might have been expected, from the different quantities of heat produced by the animal in the two cases, at least if we form our judgment from the excess of temperature of the animal over that of the surrounding air.

The difference between the quantities of carbonic acid formed at different temperatures is still less considerable. It is almost nothing, if we take the mean numbers when allowances have not been made for the temperature and pressure. When these reductions are made, it is about one tenth, one mean being 0,0347, the other 0,0382. I must, however, observe, that I have less confidence in the results relating to the carbonic acid produced, than in those relating to the oxygen absorbed, as I was unable to repeat the analyses affording the proportion of this gas; whereas I repeated two or three times those which gave the proportion of oxygen; and, as I believed, as mentioned above, that the carbonic acid might be in less proportion in the top than the bottom of the apparatus, and that the temperature might have some influence in this unequal separation.

It may be supposed, that these experiments do not afford us an exact idea of what naturally takes place, and that the transition from cold to heat was too sudden for the animal to accommodate the process of respiration to the new situation in which it was placed. Possibly, if it had remained longer in the warm air, it would have exhibited a more striking diminution in the activity of the chemical phenomena of respiration. Some experiments which I have since made, all tending to show that this supposition is to a certain degree well founded, have inclined me to think, that in no instance, a difference of fifteen or twenty degrees in the temperature of the surrounding air produces any remarkable difference in the activity of the phenomena in cold-blooded animals. But these experiments are too imperfect to be offered here, or to warrant any positive conclusions from them.

It would certainly be interesting to extend these inquiries, delicate indeed beyond what we should at first imagine. Especially to determine, at the same time, if the whole production of animal heat corresponded to the variations in the quantities of oxygen absorbed, and of the carbonic acid produced during their respiration; which would require an attention to

the portion of heat lost by the evaporation of the perspirable fluid. This appears to me the only way of determining if we can, what a great number of physiologists have considered as a solid objection, the uniform temperature of animals exposed to continual variations both in the nature and temperature of the surrounding medium. These inquiries would not be easily accomplished. I have attempted several, and though I discovered a mode of determining, pretty accurately, the total quantity of heat produced in a given time, by animals exposed to different degrees of heat, I must acknowledge, that I have been deterred by the difficulties of the work; but I cannot refrain from expressing the wish, that others more fortunate, and more patient than myself, will engage in this undertaking.

From the experiments of which I have just given the results, I do not think that we can draw any positive conclusions respecting the cause of animal heat; and I have not offered them with this view, but solely as establishing, in a manner which appears to me certain, that the elevation of the temperature of the surrounding air, far from increasing the activity of the chemical phenomena of respiration in warm-blooded animals, produces a marked, though not very considerable diminution.* If we bear in mind, that the same cause produces a great acceleration in the inspiratory and expiratory motions, we shall conclude, that there exists no necessary connexion between the frequency of these motions and the chemical phenomena of respiration.

Spallanzani has proved, as stated above, that a contrary effect occurs in cold-blooded animals. His experiments being exceedingly numerous, I have not deemed it necessary to make a great many. I chose rather to confine myself to some made on frogs. Their results, conformably to those obtained by Spallanzani, prove, that heat increases in a remarkable de-

* This at first appears at variance with a curious fact first observed by Crawford, which I have also verified, viz. that the venous blood of warm-blooded animals acquires a vermilion colour, and most of the characters of arterial blood; but on fuller reflection, it will be seen, that this fact only proves that the alteration which the blood undergoes in its passage through the capillary vessels, forming the communication between the two systems, is less when the animals are exposed to a very hot than to a cold atmosphere.

gree the activity of respiration in these animals, both as regards the chemical and mechanical phenomena. The quantity of oxygen absorbed, when the frogs were exposed to a heat of 27°, was in one experiment double, in another quadruple to what occurred when the temperature did not exceed six or seven degrees. This forms another difference, distinguishing warm-blooded animals, and those that do not hibernate, from the cold-blooded.

NOTE.

To give an idea of the manner in which I calculated the numbers which express the results of my experiments, I will point out the one adopted for the first part of my first experiment.

	h.	m.	s.
The rabbit was placed in the manometer at	11	20	0
The cock was closed at - - -	11	22	5
I collected the air respired at - - -	12	20	0

Consequently the air had served for the respiration of this animal during 60′, as it cannot be supposed that the air was sensibly renewed while the cock was open.

The thermometer stood at 13,2 when the experiment was begun. The barometer in the manometer stood 0^m 7503.

The volume of gas contained in the manometer at the close of the experiment, was the same as at the beginning, but the pressure and temperature were different. To reduce it to the state it would have been in if the pressure and temperature had not varied, I used the following formula, in which A expresses the volume which a quantity of gas, saturated with moisture, would occupy under the pressure p, and at a temperature t degrees above the melting of ice. A′ expresses the volume which it would occupy under the pressure p', at a temperature t'.

$$A' = \frac{A\left[p - \left(\begin{array}{c}\text{expansion of aq. vap.}\\ \text{at temperat. } t.\end{array}\right)\right] \times [\,1 + t'\,0{,}00375\,]}{\left[p' - \left(\begin{array}{c}\text{expansion of aq. vap.}\\ \text{at temperat. } t'\end{array}\right)\right] \times [\,1 + t\,0{,}00375\,]}.$$

This formula supposes the air inclosed in the manometer was in an extreme state of humidity, which cannot be far from

the truth; for the precaution taken to renew the air before each experiment, by filling the manometer with water, then emptying without wiping it, caused a quantity of water to remain on the sides of the vessel, sufficient to saturate the air it contained.

Applying this formula to the case in question, taking as an unit the quantity A, gives A′09923, consequently the volume of gas contained in the manometer at the commencement of the experiment being also taken as an unit, the actual diminution of gas equals 0,0077.

The analysis of the gas in the manometer gave for every 100 parts,

Carbonic acid, - - - -	0,0419
Oxygen, - - - - -	0,1528
Azote, - - - - - -	0,8053
	1,0000

The entire volume of gas, at the end of the experiment, being equal, after reducing it to the original pressure and temperature, to 0,9923, consequently the volumes of each of the constituent elements when corrected, were

Of Carbonic acid, - - - -	0,0416
Oxygen, - - - - -	0,1516
Azote, - - - - -	0,7991
	0,9923

At the beginning of the experiment, there were

Of Oxygen, - - - - -	0,21
Azote, - - - - -	0,79
	1,00

Consequently there was a production of 0,0091 of azote, and of 0,0416 of carbonic acid, and an absorption of 0,0584 of oxygen.

The same formula served for reducing the volumes of oxygen absorbed and of carbonic acid produced, supposing them in the state of extreme dryness, at the heat of melting ice, and under a pressure of 76 centimeters of mercury. Accordingly for A then presented, the volume of carbonic acid

produced under a pressure of 0,7474, and at the same temperature of 13°,2 being 0,0416, p 0^m,7474 t was 13°,2, p' was 0^m,76′, t' was reduced to nought, the aqueous vapour possessing no expansive force at this temperature.* I thus obtained 0,0383 for A′, or the volume which the gas produced, when reduced to the state of extreme dryness, would have occupied under a pressure of 0^m,76 of mercury, and at the temperature of melting ice. The same correction was applied to the oxygen absorbed.

On the Cauliflower Excrescence from the Os Uteri; and Case of a Collection of Pus in the Cavity of an unimpregnated Uterus. By John Clarke, M. D.†

[From the Medical and Physical Journal, for July, 1812.]

The object of the present communication is to give some account of a disease not hitherto described, as far as I know, by any writer on the diseases of the female organs of generation, or in any book on Morbid Anatomy, though it is far from being uncommon. From its external form and structure in the living body, I have for many years been accustomed to describe it, in my lectures, under the name of the cauliflower excrescence of the os uteri, meaning to distinguish it from other diseases of structure of this part of the body, but especially from cancer, with which disease it has generally been confounded.

Having been for many years much consulted about the diseases of the female sex, I have been led to observe, that there is a great variety in the symptoms of diseases, which pass under the common name of cancer. On accurately investigating, by examinations in the living body, the structure of different diseased parts, and connecting this with the variety

* The expansive power of aqueous vapour at the temperature of melting ice is so very small, that, in calculations of this kind, it may be assumed as nothing, without any sensible error.

† Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, 1812.

in their symptoms; and particularly observing in the disease, which is the subject of this paper, the absence of many symptoms which characterise cancer, and some other diseases of the uterus, I consider myself justified in giving to it a new name, which is in some degree descriptive of its structure.

It appears to me to be of great importance to distinguish, by different names, diseases which have some symptoms in common; otherwise, a confusion in name will lead to confusion in practice, and to the use of the same remedies in disorders very different from one another. If, in some cases, advantage has been received by the patient; in others, much mischief has been done. Error has been propagated, and improvement in practice could not reasonably be expected.

I cannot omit this occasion of observing, that the treatment of diseases of the uterus, upon the mere description of symptoms given by a patient, without any examination of the parts, or upon the examination and representation of persons not conversant with the healthy or diseased structure of them, is not likely to be productive of advantage to the patient, or to add to the stock of knowledge heretofore acquired. No person should prescribe for these diseases without examining himself, and every medical man ought to be competent to make such an examination, otherwise he will be likely to do much mischief.

Having very frequently met with the cauliflower excrescence of the os uteri, I was much surprized that I could find no specimen of it in any collection of anatomical preparations. I sought for it in vain in the collection of the late Dr. William Hunter. There is no specimen of it in the collection made by Mr. John Hunter, now in the possession of the college of surgeons; and in all my inquiries, among those who had the best opportunities of finding it in the dead body, I have never been able to procure a specimen, which I could add to my private collection, for the purpose of exhibiting it in my lectures. The reason of this will be satisfactorily explained by two cases, which will be related in this paper.

The cauliflower excrescence arises always from some part of the os uteri. As several of the early symptoms are not very distressing to the patient, the tumour in the beginning is rarely

the subject of medical attention; the first changes of structure have therefore not been observed. I do not recollect that I have ever met with a case, in which the size of the tumour was less than that of a blackbird's egg. At this period it makes an irregular projection, and has a base as broad as any other part of it, attached to some part of the os uteri. The surface has a granulated feel; considerable pressure, or handling it, does not occasion any sense of pain. The remainder of the os uteri will, at this period, be found to have no sensible alteration of structure. By degrees, more and more of the circle of the os uteri, and the external part of the cervix uteri, become affected with the same morbid alteration of structure, till at length the whole is involved in the disease.

The growth is in some cases slow, but in others rapid, so that, in the course of nine months, it will sometimes entirely fill up the cavity of the pelvis, and block up the entrance of the vagina.*

* I learned this fact from the following case. I was consulted by a young woman, about twenty-six years of age, who was suffering under a profuse uterine discharge, the appearance of which led me to believe, that it proceeded from this disease. I was confirmed in this opinion, by finding the whole pelvis filled with a cauliflower excrescence so large, as to impede the free passage of the fæces and urine. She appeared to be sinking fast under the quantity of the discharge. No statement was made to me of the probability of her being pregnant.

As she did not reside in London, I saw her only a few times. About six weeks after my first visit to her, she was suddenly seized with pain in the abdomen, which increasing in violence, a medical man in the village where she lived was sent for. Upon making an examination, he discovered a large tumour projecting from the orifice of the vagina. Having left the room for a short time, he was hastily recalled, and on returning he found, that the head of a child protuded. Soon after, the child was born, and in a short time the placenta came away. No unusual discharge following, it was supposed by those present, that no disease existed. However, in a short time, when the puerperal discharge had lessened, all the former symptoms returned, and I was again desired to visit her. On examination, I found the excrescence filling up the pelvis as before. The discharge from it became daily more profuse, and in six weeks after delivery she died, in a state of the greatest emaciation.

From the history of this case, I am led to believe, that the disease must have been formed after conception, both because she had no symptoms of disease nine months before her delivery, and because, in the state of the

As the bulk of the tumour increases, the granulated structure becomes more evident, and is found to resemble very much the structure of a cauliflower, when it begins to run to seed. In most cases, it is of a brittle consistence, so that small parts of it will come away, if it be touched too rudely, and such pieces appear to be very white. Sometimes, though no violence has been used, small portions of a white substance come away with the urine of the patient, and in the discharge from the vagina.

When the tumour has arrived at a size greater than that of the os uteri, it spreads very much, and as the base is the smallest part of the tumour, persons, not conversant with the disease, have often mistaken it for polypus. A little attention, however, to the feel of the tumour, and the breadth of its base, will be sufficient to distinguish them.

In the very early state of the cauliflower excrescence, a discharge from the vagina takes place like fluor albus. It very soon becomes thick and watery, and is sometimes tinged with blood. In most cases, upon coming away, it is apparently as thin and transparent as pure water; but the linen, on which it is received, when dry, becomes stiff, as if it had been starched. The quantity of the discharge, when the excrescence is large, will sometimes be sufficient to wet thoroughly ten or twelve napkins in a day. Now and then a discharge of pure blood occurs. When this ceases, the discharge of a thin transparent fluid re-appears. An offensive odour generally accompanies the discharge, which is greatest when there has lately been an evacuation of pure blood, or of the catamenia.

Through the whole course of the disease, I have never found, in any instance, any appearance of pus in the fluid discharged from the vagina. Sometimes, however, mucus will be seen in it.

os uteri, attendant on this disease, it is not likely that conception should take place.

It appears that, when she fell into labour, the tumour was expelled, before the os uteri could be dilated for the passage of the child's head, and before it could pass through the pelvis. As soon as it was born, the tumour receded into the vagina, and no further examination was made at that time.

The catamenia are affected in an early state of this disease. This discharge is, however, generally more abundant than in health, and the period is apt to last longer. With the catamenial secretion, blood is very often effused. When the constitution becomes much weakened, menstruation is less regular, and, in the last stages of the disease, it observes no regular period.

Patients, labouring under this disorder, are variously affected with regard to pain. In the commencement none is felt; but during its progress, pain is in some cases experienced. Generally, in the advanced stage, the patient feels pain in the back, and in the direction of the round ligaments of the uterus. The pain is not described to be lancinating, as in cancer, and is without any sensible aggravation by paroxysms; but on the whole, it is most felt after the patient has been long in a perpendicular attitude.

The disease attacks indiscriminately women of all ages. I have lately met with a case, in which it proved fatal before the age of twenty-five years. The patient is destroyed by the debility occasioned by the profuse discharge; and, in the course of the disease, she always becomes extremely emaciated. That this depends entirely on the discharge, will appear from the consequences of the treatment pursued in a case hereafter described. I have never met with an instance, in which the disease did not terminate fatally. As it seemed quite evident, that the diminution of bodily strength in this disease is owing to the discharge, I had for many years wished for an opportunity of removing the excrescence by a ligature, to ascertain whether relief might be obtained by this operation; believing, from the insensibility of the tumour, that it would not increase the danger of the patient. At length, a favourable case presented itself about three years ago. At that time I was called upon to visit a patient, who was supposed to have a polypus of the uterus. She had been very much weakened by a continual discharge from the vagina before I saw her, and was apparently sinking very fast. On examination, I discovered that there was a cauliflower excrescence of the size of an orange, growing from about one third of the circle of the os uteri. The uterus above the tumour was enlarged.

It was agreed in a consultation, in a case so hopeless, to attempt the extirpation of the tumour by a ligature, which might be instantly loosened, if any pain or other inconvenience should be produced by it. I accordingly passed a ligature round the base of it, as near to the os uteri as possible. The patient was not sensible of any pain upon tightening the threads. I therefore left her, with directions to send for me, if she should be in pain; but I heard nothing from her. On the following day, finding the threads slackened, I tightened them. Still no pain was occasioned, but I found that the watery discharge had ceased altogether, and that a thicker had succeeded, which was small in quantity, and very offensive. On the next day the ligature came away, proving that the tumour was divided at its base. I immediately examined the cavity of the vagina, but found no tumour there, and from the most strict inquiry, ascertained that nothing had passed from the vagina. I again examined the vagina with great accuracy, and found a small portion of a white, glary substance, which might have been contained in half of the shell of a pigeon's egg. From this time she had no more watery discharge, and in a few weeks, from having been much emaciated, she regained a considerable degree of plumpness. After this, however, a purulent discharge occurred from the vagina. I saw her again, and found that the lower portion of the uterus was become diseased. The os uteri was irregular and knotted, and the interstices of the knobs were in a state of ulceration. To this state symptoms of irritation succeeded, and she died. The body was not examined after death.

I have since had an opportunity of inspecting, after death, the uterus of a patient affected with the same disease, whom I had attended for many months. A few days before her death, the cauliflower excrescence was examined by my brother, Mr. Clarke, and it was then as large as an orange. She had suffered very much from a profuse discharge of watery fluid, and towards the conclusion of her life, a symptom occurred, which I never before met with, a loss of sight, without any apparent alteration in the structure of the eye. On examining the os uteri, the day after death, no tumour appeared; and it was clearly ascertained, that nothing solid had come away

during her life. The body and fundus of the uterus were sound. From about half of the os uteri, hung a slimy, flaccid, white, and very tender substance, resembling the fœtal portion of the placenta of a graminivorous animal. It was desirable to ascertain, whether it could be artificially filled by injection, so as to restore its former size. The attempt was accordingly made; but it failed, from the injection escaping from every part.

On considering and comparing these two cases, it appears to me, that the application of a ligature in one case, and the death of the patient in the other, produced the same effect; that is, the supplies were cut off, and the vessels, which had before contained the fluids, collapsed, and almost disappeared. If all cases of cauliflower excrescence are of the same structure, which, from the similarity of the discharge, there is reason to believe, the disease consists in the growth of a præternatural substance from the os uteri, which, when touched, feels like a solid substance, but when emptied of its contents collapses, so as to occupy but a small space.*

In this paper I have taken no notice of the symptoms arising from mechanical pressure, because they are common to this disease, and all other tumours of the same magnitude, occupying the same situation.

Respecting the treatment of this disease, I can offer at present, little satisfactory information. The disease being described, and distinguished from others, is something gained. All stimulating substances, either in diet or medicine, seem to aggravate it, by increasing the discharge; and no astringents internally given, which I have tried, appear to lessen it.

The only means, from which I have seen any benefit derived, is the injecting into the vagina, three times a day, a strong decoction of cortex granati, or of cortex quercûs, in which alum is dissolved, in the proportion of eight or ten

* I consider that the circumstances which took place in the case where the ligature was applied, and the appearances on the inspection of the parts in the dead body, afford a satisfactory explanation, why this disease is not found, as a tumour, in collections of morbid anatomy, and why it has not been described by any writer upon that subject. No account of it is to be found in the valuable work of Dr. Baillie upon Morbid Amtomy.

grains to every ounce of it. This has the double effect of lessening the quantity of the discharge, and rendering it less offensive.

It is scarcely necessary to add, that the use of anodynes must be resorted to for the mitigation of pain, and that the occasional symptoms of suppression of urine, and costiveness, are to be relieved by the use of a catheter and mild laxatives.

P. S. Since the foregoing paper was laid before the society, a case of cauliflower excrescence, connected with pregnancy, has occurred in the practice of my brother, Mr. Clarke.

Margaret Pole, aged thirty-two years, the mother of eight children, discovered that she was pregnant in the beginning of the year 1810. From the commencement to the termination of her pregnancy, she had a constant discharge from the vagina, generally watery, but sometimes bloody, by which she was extremely debilitated. On the 1st of July she was taken with labour pains. The practitioner, who was first called to her, finding a large tumour in the vagina, in his opinion resembling the placenta, and the discharge being at this time very profuse, my brother was called to his assistance. When he arrived, he found the patient perpetually vomiting, and having a pulse, quick, frequent, and weak. On examining the tumour, he ascertained its structure to be that of the cauliflower excrescence. At this time, the os uteri was not much dilated, but the discharge of watery fluid tinged with blood was very great.

Early in the morning of the 3d of July, she was delivered, without the assistance of art, of a putrid child, and the placenta followed in the usual time.

On the 4th and 5th of July, a great quantity of discoloured watery fluid came away; her belly became tender upon pressure, and much swollen. On the 6th, aphthæ appeared on the palate, tongue, and inside of the cheeks. The vomiting had never ceased; she became gradually weaker, and died on the 7th of July.

On examining the state of the parts after death, my brother found, by slitting up the vagina, that the tumour had disappeared, though in the patient's life-time it had filled nearly the

whole of its cavity. In its place was a pulpy, unresisting substance, very little firmer than mucus.

An attempt was made to fill the tumour, from the vessels of the uterus, with fine injection, but the injected fluid always escaped from the vessels of the pulpy mass. The vessels, of which this species of tumour appears to consist, are of a very tender texture, and soon become too putrid to bear the force necessary to be employed, in attempting to fill them with injection.

From the resemblance between this case, and one described in the paper to which this is annexed, there is every reason to believe, that the disease must have begun, in this case also, after the commencement of pregnancy.

Case of a Collection of Pus in the Cavity of an unimpregnated Uterus.

On the 12th of January, 1812, I visited Mrs. A. B., about sixty-five years of age, who had ceased to menstruate for many years. A few weeks before I saw her, she had informed Mr. Brande, who attended her, of her having a small sanguineous discharge from the pudenda. The discharge was not attended by any pain, but, as she was rather heated, he gave her occasionally some sulphate of magnesia in infusion of roses, from which she considered that she experienced relief. After this, she had, as she informed me, a discharge, at first like fluor albus, and small, but which afterwards became of a brownish colour, offensive to the smell, and greater in quantity. A very short time before I saw her, she had experienced a more considerable sanguineous discharge, but without any pain.

She readily agreed to an examination per vaginam. I found the os uteri rugged, and much harder than usual. The cervix was of the common length, but was hard to the touch. From the upper part of the cervix, a tumour bulged out in all directions, so as to occupy nearly the whole space from the os pubis to the os sacrum. She was of a spare habit of body, but this was natural to her. Her tongue was not foul, and there was nothing remarkable in her pulse. There was no unnatural heat

of her skin; she had not been attacked by any shivering; and she passed her fæces and urine as in health. To the time of my first seeing her, she had frequently walked in the open air, and had pursued at home her accustomed occupations; and afterwards, even to the day on which she died, she walked about her house, without pain or inconvenience.

Considering all the symptoms, and the patient's time of life, a favourable termination of the case was not to be expected. Only such measures, therefore, were adopted, as were calculated to remove the irritation arising from the discharge.

As there were no urgent symptoms in the case requiring constant attendance, I saw her occasionally only. On my second visit, which was on the 29th of January, she described her situation as being more comfortable; the discharge was diminished in quantity, and was become less offensive, and less irritating.

Early on the 31st of January, she sent in haste to Mr. Brande. When he arrived, she told him, that, after passing a very good night, upon waking, she was suddenly seized with violent pain in the lower part of the abdomen, and a sensation, as if something had suddenly given way there, and that she was still in great pain. She had passed her urine at four in the morning; after the attack of pain, however, she could pass no more, but had a frequent desire, attended with uneasiness, to empty the bladder. She was now in a state of extreme weakness and faintness, like a person nearly expiring, having a small thread-like pulse, great paleness of the surface of the body, and coldness of the extremities. Mr. Brande directly administered some cordial remedies, from the effect of which her pulse was improved, and she recovered, in a considerable degree, from the state of faintness, in which he had found her. In the middle of the day I saw her, and drew off from the bladder about half a pint of urine of a natural colour; after which she said that she felt more easy. Her pulse at this time was frequent, but not very feeble; her voice was strong, and her faculties entire. Her arms, which lay out of bed, were cold, but her legs and feet were warm; in the face she was paler than I had seen her before.

After I left her, she gradually became weaker, and in the evening of that day she died, having preserved the faculties of her mind nearly to the last.

Before she died, she desired that her body might be examined. The examination was accordingly made on the 2d of February.

On opening the abdomen, about seven or eight ounces of a most offensive purulent fluid were found in its cavity. When this was cleared away, the part of the small intestines which presented itself, showed very strong marks of preceding inflammation, and their different folds were connected by coagulable lymph, which appeared to have been lately effused. There were also some adhesions, which had been of longer standing. The extremity of the broad ligament of the uterus on the right side was pretty firmly connected to the peritonæum, in such a manner, that the lower part of the small intestine, in going to the head of the colon, passed under the fallopian tube, so that a strangulation of the gut might have taken place at that part.

On raising the intestines to expose the contents of the pelvis, a tumour appeared, in a gangrenous state, with an opening in the upper part of it, through which, on the slightest pressure, a quantity of offensive pus issued, similar to that which was found in the cavity of the abdomen. The bag containing it appeared to be in contact with the quantity, which still remained in it, probably about five ounces.

This matter being removed, the bag was discovered to be the uterus in a distended state. Both its external and internal surfaces were of a very dark colour, exhibiting nearly the appearance of a mortified part. On the internal surface there was an appearance like half coagulated lymph, but there were no traces of any cyst, so that the fluid was contained in the uterus itself. The internal surface of the uterus had a honeycomb-like appearance. The orifice between the cavity and the cervix was closely contracted, so as not to have allowed the contents of the uterus to be discharged through it.

The circumstances worthy of observation in this case are;

1. That so much inflammation should have existed in the cavity of the abdomen, as to have firmly connected the ex-

tremity of the broad ligament to the peritonæum opposite to it, and that a very active state of inflammation of the intestines should have more recently occurred, with effusion of coagulating lymph, so as to connect the convolutions of them to each other, without either having been attended with pain.

2. That so large a quantity of purulent matter should have been formed in the cavity of the uterus, (that found in the abdomen having evidently proceeded from the uterus) amounting to twelve ounces at least, without any preceding marks of the presence of inflammation.

3. That, as there was no cyst in the cavity of the uterus, the contraction of the cervix should have been sufficient to prevent the exit of the fluid, as the cervix was readily pervious to a probe after death.

4. That the uterus, which in many cases of disease, as in common inflammation of its substance, in that species of inflammatory action which takes place in painful menstruation, in scirrhus and in cancer, is so very susceptible of pain, should have suffered so much mischief and derangement of structure without giving the slightest sensation of pain.

5. That, as the fluid escaped, the uterus contracted, so as to apply itself to the remaining contents.

6. That, as there was no communication between the cavity of the uterus and the vagina, the sanguineous and other discharges must have taken place from the cervix and os uteri, and the vagina.

Some Remarks on the Fevers of Sicily; with an account of the Autumnal, or Bilious Remittent Fever of that Island, as it appears among the British troops. By ALEXANDER BOYLE, A. M. Surgeon to the 62d Regiment of foot.—Communicated by N. BRUCE, Esq. Surgeon to the Forces.

[From the Edinburgh Medical and Surgical Journal, for April 1812.]

THE febrile diseases, which usually prevail among the British troops in the island of Sicily, are not of great variety; and those which demand most attention, and which most frequently occur, are the invariable attendants of summer, or of the early part of autumn: while those to which the soldier is exposed at other seasons, differ not, in any important or essential symptom, from the same diseases, as they commonly appear in more temperate and northern latitudes.

In all climates, indeed, diseases of this class have certain symptoms in common, which constitute their permanent character, and establish a certain affinity among the whole. In those of Sicily, this affinity becomes still closer, inasmuch as they all may be ranked among the diseases of increased excitement. Local inflammation seems to be always present; and is, in general, sufficiently manifested by the appearance of some external affection, or the lesion of some important function.

In organs, however, which display a wide sympathy with other parts of the system; whose functions are various, or intimately connected with the phenomena of life; it becomes extremely difficult to analyse, (if I may use that expression), the changes and appearances frequently produced by local inflammation of those parts; and, except such symptoms as are common to the whole of the *Pyrexiæ*, it often happens, that no peculiar or distinctive sign is to be observed. Such, indeed, is the mutual relation and dependence established between certain organs, that, when invaded by inflammation, the generic characters of the disease, or those depending on the lesion of the natural function of the part, necessarily become obscure, and are only to be detected by the careful and diligent observation of facts. The assistance afforded by anatomy, therefore,

is not to be neglected. It opens the most authentic sources of information, and displays a wide view of the causes of diseases proceeding from disordered structure, or peculiar arrangement of parts, and thereby enables us to arrive at the explanation of some of their most important phenomena. The road to truth, however, it must be acknowledged, is intricate; and it is only by slow and difficult steps that we can arrive at general conclusions. "Medicinam cito discere, non est possibile, propterea quod impossibile est statam, et certam doctrinam in ipsa fieri." *Hipp. de locis in homine.* In a great number of cases, however, such as acute rheumatism, pneumonia, as also in many of the profluvia, which are closely allied to inflammation,* the seat of the disease is made sufficiently apparent, by certain obvious and unequivocal symptoms, depending on the peculiar structure and office of the organ concerned, which constitute their distinctive and generic signs.

It is universally allowed, that the more general symptoms of pyrexiæ, or those in which they all agree, are permanently uniform; and their similitude, in this respect, it is presumed, may depend on the similarity of their proximate cause. In the above examples, this is easy of detection; and, in the febrile diseases of this country, it will be found to consist in an increased vascular action, or determination to some particular part, produced by the application of specific causes, aided by certain circumstances of constitution or mode of life, affecting the general habit.

In a former communication,† concerning the febrile affection which prevails during the torrid months of summer, those causes were partly explained, the chief of which is found to be the direct action of a powerful and vertical sun. That other causes may also contribute to produce this disease, it is not my intention to deny; as, like all inflammatory diseases, a predisposition will no doubt be formed by whatever tends to produce a plethoric state of the vascular system, whether referable to diet, exercise, or the suppression of the natural or accustomed evacuations and secretions. These, however, are to be re-

* Cullen's Synopsis—Order *Profluvia.*

† Edin. Med. Journal for October 1810.

garded solely, as *occasional causes*, which equally favour the operation of a variety of other powers *directly* applied, which are distinguished by the appellation of exciting causes, and whose mode of application and action, as in the present instance, determines the seat of the disease.

It may in this place be observed, that, during the winter also, fevers occur in which the head is sometimes affected; but, in such cases, it is seldom a primary disease, this affection only supervening in consequence of metastasis, and appearing as a symptom attending violent attacks of other diseases caused by checked perspiration and vicissitudes of temperature; as pneumonia, catarrh, acute rheumatism, and the like. In a certain epidemic inflammation of the lungs, mentioned by Morgagni, its appearance was very common, and more recovered in whom this symptom was observed. Morgagni, Epist. 7. Art. 12.

To the disease of summer I assigned the title of Cephalitis. To ascertain, however, by any train of symptoms, what particular part of the encephalon is more especially affected, it must be readily allowed, implies a degree of discrimination, at least, not easily to be attained; and it is even doubted by some, whether the road to this discovery could be much facilitated by dissection.*

It is supposed by Galen, that the pulse affords some information on this subject, and that when the cerebellum is affected, it becomes weak, undulating and tremulous. This is undoubtedly an alarming symptom, and invariably indicates extensive derangement of the structure of the brain. Such, however, is the connection throughout the system of vessels distributed on this organ, that, in whatever part the inflammation does begin, it will, no doubt, speedily affect the energy of the whole.

It is nevertheless certain, that the effects of simple inflammation are very different from those of mere compression, whether it proceed from effusion, or from vascular congestion; and it is equally true, that the symptoms of both may be combined in various stages and degrees. The appearance of serum or coagulable lymph is very common, even when no redness or

* Cullen's Synopsis.

turgescence of the vessels remain, and which, though (as is supposed by Morgagni) it had previously existed, disappears on a copious effusion taking place; at which period, the symptoms assume a different complexion, constituting what I have called the second stage. It may, perhaps, therefore be admitted, that the great tendency to early effusion in this disease, is the cause of furious or phrenitic delirium being so rarely met with.

The absence, therefore, of furious delirium (I may say, almost in every case, the exceptions being so very few), and the great tendency to drowsiness, and coma, even in the earliest stages of disease, establish some difference between it and what is nosologically termed *Phrenitis*. It is therefore, perhaps, with some propriety, that another species, characterised by such symptoms, has received a place in some systems, under the title of *Cephalitis*.

In my paper, which appeared in the Edinburgh Medical Journal for October 1810, I adopted this term; not so much, however, with a view to nice distinction, or a display of nosological accuracy, as with the design of fixing the attention on the conspicuous features, and seat of the disease; expecting thereby to obviate more readily some errors in practice, which I conceived had arisen from its having formerly been universally considered a simple *idiopathic* fever; and as, for the reason above assigned, the term phrenitis, though of the same family, did not appear altogether so appropriate, or to combine so many of the circumstances attendant on this complaint.

On this part of the subject I shall not now detain you long, as I shall, perhaps, resume it at a more convenient opportunity. I shall therefore only briefly mention, with respect to the method of cure, that I have recently learned, that bloodletting had occasionally been practised in certain fevers of this country, at a period somewhat anterior to that at which I had fixed its introduction. The practice, however, of *copious* bloodletting, has not been long general among medical men in this army; and I presume, it can only be dated from the time that the appearances on dissection, of two patients, who died in Melazzo, in July 1809, (as related in my former paper), served to establish a more rational pathology of the disease. Pre-

viously to this, it is apprehended no fixed principles were known, to guide or direct its use; and we may thus, perhaps, account for the practice having been, for the most part, feeble and undecided. Though it might, for a moment, retard the progress of the disease, it was seldom sufficient to subdue it.

The symptoms of the second stage, in the mean time, began to make their appearance, and seemed to direct an opposite mode of treatment, and the result was generally fatal. Those symptoms which had formerly been attributed to debility, were now traced to their true origin; and the plan of giving bark and wine, when this stage approached, was universally abandoned, as soon as the testimony of indisputable facts superseded fallacious hypothesis and conjecture.

The vicissitude of seasons, and the various modifications of atmospheric constitution, powerfully influence the character of diseases, and the appearance of certain epidemics, in this climate. Accurate meteorological observations, therefore, as well as the investigation of those circumstances, which properly constitute medical topography, present an interesting field of inquiry, and not only facilitate the investigation of the cause of diseases, but form a branch of knowledge essentially connected with their prevention, and method of cure.

In remoter ages, this subject received particular attention, and almost every page of the writings of Hippocrates inculcates the utility of this study,—which was considered, by that great man, not less essential to the physician, in order to enable him to predict approaching changes, and guard against their effects, than it was deemed necessary by the Mantuan poet, for the husbandman and mariner.

> "Hinc tempestates dubio prædiscere cælo
> Possumus; hinc messisque diem tempusque serendi:
> Et quando infidum remis impellere marmor
> Conveniat; quando armatas deducere classes,
> Aut tempestivam silvis evertere pinum.
> Nec frustra signorum obitus speculamur et ortus,
> Temporibusque parem diversis quatuor annum."

As far as regards the great revolutions of the year, and the periodical return of the seasons, a great uniformity obtains;

and the observations of one year on this head, with but little variation, apply almost to every other.

On this depends the great uniformity of the diseases which usher in the different seasons. Those seasons, however, differ materially from each other; and a difference not less remarkable, and important in practice, characterises the diseases by which they are invariably attended; and which, agreeably to those changes, undergo certain alterations of type, as well as of other important symptoms.

The occurrence of the dry and rainy seasons may always, indeed, be expected with tolerable certainty, at the regular and accustomed periods. The diurnal vicissitudes, however, are very frequent; and, until the hot season has fairly set in, sudden changes of temperature are very common.

From the beginning of June may be dated the commencement of the hot season; from which time, until the beginning of September, the temperature continues pretty steadily about the same standard; and, as observed in the shade at noon, usually ranges between 82° and 86° of Fahrenheit's scale. During this period, east or westerly winds for the most part prevail; rain seldom falls; and it frequently happens that the months of June, July, and August pass away, even without a single shower. Of these, July is the hottest month, and the thermometer sometimes reaches the 89th degree; while the suffocating sirocco winds commonly continue until noon; after which hour a westerly breeze generally springs up.

About the latter end of May, inflammatory affections of the head begin to make their appearance; but they, as yet, are generally slight. In the month of June, however, and as the heat of the season advances, they become more frequent in their appearance, as well as more violent in all their symptoms.

About the beginning of September, the weather undergoes a very remarkable change, which is more particularly to be attended to, on account of the important influence it exerts as a cause of the disease which now succeeds. Together with a diminution of temperature, rains begin to fall, accompanied with thunder and high winds. About this time, the thermometer falls to 76°, indicating a diminution of temperature, not

less than 10 or 12 degrees. This change is sudden, and produces a very conspicuous effect on the nature of the prevailing disease.

The fevers still are of the inflammatory kind, but the affection of the head no longer forms so conspicuous a symptom; instead of which, they now manifest themselves under the form of phlegmasiæ affecting other parts.

The showers, however, are but transient; the mercury in the thermometer again rises, but does not again attain so great a height; and the weather becomes dry and settled, until about the end of October, when heavy rains set in, accompanied with a considerable and permanent diminution of temperature, which puts a period to the violence and frequent occurrence of the epidemic.

During the winter, and spring, pneumonia and acute rheumatism are the prevailing complaints; but those which prove most tedious and fatal, are obstinate dysenteries, and intermittents; the common sequel of violent attacks of the autumnal fever, and dependent on chronic affections of the abdominal viscera.

Owing, no doubt, to the temperate and abstemious mode of living peculiar to the native inhabitants of these climates, as well as to constitution, and habits formed in infancy, those changes are not observed to operate so powerfully on them, as on the natives of more northern and frigid latitudes; and they are, at all seasons of the year, exempt from those violent attacks of inflammatory diseases to which the British soldier is more particularly subject.

The Sicilian peasantry are indeed uncommonly healthy, and robust; and some of the more elevated, and mountainous situations, furnish many instances of athletic constitutions, and remarkable longevity. But, wherever opulence and luxury have been introduced, or where these effects are not controlled by salutary laws, they soon become visible, not only in the moral character, but ultimately tend to the degeneracy of the species. Whether, indeed, it may be owing to the same general principle, which invariably is found to stamp the peculiar turn of mind of the inhabitants of alpine regions, I shall not take it upon me positively to determine; certain, however, it is, that

among the Sicilian peasantry, there still does exist a freedom of manner and sentiment meriting some attention; and the idea of degeneracy, which we are accustomed so readily to associate with the name of the Italian, is to them inapplicable. "Ubi enim regio est nuda, naturâ munita et aspera, quæque et a frigore hyberno prematur, et a sole æstivo exuratur, ibi duros et robustos et articulis probe disjunctis, vegetosque et hirsutos reperias homines, et in quibus a naturâ laboris tolerantia et vigilantia insit; quique mores habeant pertinaces, ad iram proclives et contumaces, magisque feritate participantes quàm mansuetudine; insuper ad artes etiam acutiores et plus solertes, et ad res bellicas gerendas aptiores."*

But to return from this digression: On the approach of autumn, the character of the fever, as has been already said, undergoes a considerable change; and though this is effected by apparently slow gradations, one epidemic passing, as it were, imperceptibly into another, they not only differ essentially as to their exciting causes, but also in their origin, and seat; the febrile disease of summer arising from affections of the encephalon, depending on inflammation and its consequences; while those of autumn are more particularly dependent on inflammatory affections of the stomach, and other abdominal viscera.

Those who are attacked at the beginning of the season, still invariably complain of violent headache, languor, and severe pain in the loins, with nausea, and uneasiness in the epigastrium. These symptoms are ushered in by irregular rigours and lassitude, and are not unfrequently accompanied by profuse sweating over the upper part of the body. From the beginning, there is always a slight cough, but it is seldom such as to give much uneasiness to the patient, or even to be readily attended to by others. The region of the stomach is sometimes tense, and painful on pressure, and they complain of a sense of weight and fulness. Vomiting does not always appear on the first accession of the disease, but invariably comes on before the end of the second day, and vast quantities of dark-coloured bilious matter are thrown up.

* Hippocr. de Aeribus, &c.

The state of the bowels is various. For the most part there are frequent, watery, dark-coloured bilious dejections; in the severer cases mixed with flakes, resembling coagulable lymph, and generally tinged with blood. At other times, we meet with obstinate costiveness from the commencement, in which case the symptoms always ameliorate as soon as we are able to procure a free discharge of the alvine matter. The tongue is always moist, and is often covered with yellowish mucus. The thirst is excessive.

During the early part of the disease, the general febrile symptoms are such as denote increased vascular action; the pulse, though soft, is always full, and usually exceeds 100 strokes in a minute. The countenance is full and florid; the eyes are lucid, and the vessels of the conjunctive coat are commonly injected with blood. These symptoms form the first series, and seldom continue beyond the third day.

As they abate or disappear, the patient shows extreme anxiety and restlessness, writhing with inexpressible agony, and changing his posture a thousand times, without finding ease or repose. Every thing received into the stomach is instantly rejected; the tongue becomes covered with dark, inky, or yellow-coloured matter, and the thirst unextinguishable.

About this time the countenance undergoes a remarkable alteration, bespeaking the sufferings of the patient. The eyes lose their lustre; and, about the fifth or sixth day from the commencement of the fever, the albuginea, and whole surface of the body, assume a dull yellow tinge. The pulse increases in frequency, and, in three or four cases, I have been able to count 140 strokes in a minute. It is very hard, and sometimes even continues full and soft, till within a few hours of the fatal termination of the disease.

The surface of the body always, at the beginning, exceeds the natural temperature, communicating to the hand an acrid pungent sensation, but about this period it sinks to the ordinary standard.

Hæmorrhagy sometimes takes place from the nose, and it generally denotes a favourable change; which, however, is still more certainly to be expected from a return of the natural complexion, and whiteness of the albuginea. These form the

second series of symptoms, which may continue two days longer; and are then succeeded by a state of quietude and great prostration of strength.

Delirium is seldom present; and though, during this stage, they lie apparently asleep, yet, when interrogated as to their feelings, they read ly answer; they tell you they have no uneasiness, and appear perfectly in possession of their intellectual faculties, until the moment of their death. As this period draws near, the breathing always becomes very laborious, with heaving of the abdomen, and strong action of the pectoral muscles, and the breath is forcibly drawn through the nostrils. The vomiting sometimes ceases about this period; and it occasionally happens, that when stools are procured by medicines, they have a natural appearance. Flatulence sometimes appears at the beginning, but it more frequently takes place at this period, and is accompanied by singultus—and, after this last symptom, I never saw one recover. The forehead is now bedewed with cold clammy sweats; the countenance assumes a deadly paleness; the extremities become cold; the pulse sinks; and they expire with composure. The course of the disease is rapid; and it generally terminates before the ninth day.

Though such is the more frequent mode of attack, it sometimes, however, happens, that its approach is not only less violent, but also less sudden. In this case it begins with loss of appetite, irregularity of the bowels, and sense of weight in the region of the loins, with heat and distention about the præcordia. They are listless, and averse to every exertion, both mental and corporeal. These premonitory symptoms are frequently the harbingers of the most serious attacks. They are attended with languor, anxiety, and great prostration of strength. Sometimes irregular flushings of heat succeed; but neither the temperature of the body, nor the state of the pulse, indicates any material deviation from a state of perfect health.

In this variety, the determination to the head is less conspicuous, and the eyes, though lucid and bright, are never suffused with blood. The thirst is not to be extinguished; the tongue is moist, and of a pale smooth clay-colour. While these symptoms continue, there never is much expression of pain or uneasiness; but this I have found one of the most dan-

gerous symptoms, and which, in almost every case, portends a fatal event. Vomiting sets in soon after, with hiccup, and fruitless efforts at stool. Hæmorrhagy from the nose, though less frequent in this form of the fever, nevertheless sometimes does occur, and is almost always accompanied by petechiæ, or large irregular livid blotches on the arms and thighs; the pulse becomes full and bounding, and some other such marks of general hæmorrhagic tendency appear, and which are always to be regarded as highly dangerous. Other eruptions, however, are sometimes discovered, which afford evident relief from the most obstinate vomitings and bilious diarrhœa. They are generally of the miliary kind, or resemble urticaria, and are to be regarded as favourable omens.

In the case of a lad, about twenty years of age, who was affected with violent symptoms, with a full soft pulse, beating 120 in the minute, attended with incessant vomiting, and slimy bilious evacuations by stool, great anxiety and restlessness, an eruption of the nature of urticaria, in blotches about the size of the hand, appeared on his thighs and arms on the fourth day of the disease, and gradually spread over his whole body. Towards the evening of the same day, the vomiting ceased; a copious sweat broke forth, and the pulse fell to 84. On the following morning the eruption had nearly disappeared, and the surface of his body was still covered with gentle moisture; he had five liquid stools, of a natural colour, during the night; the vomiting had not returned, and the anxiety and restlessness had entirely ceased. This case occurred about the latter end of September, and terminated afterwards in tertian intermittent, which was finally cured by the internal use of mercury.

It is not always, however, that the disease preserves this uniform continued course, but is subject to diversity of form, not less frequently affecting its type, than its manner of approach and early symptoms.

When the epidemic first appears, in the early part of autumn, the general febrile symptoms preserve the most continued form, nearly throughout the whole progress of the disease, and only show some tendency to remit, after the violence of the excitement has been subdued. At its commencement,

therefore, it bears a very strong analogy to the bilious remittent fever of all warm climates; it is closely allied to that fever which annually visits other parts along the shores of the Mediterranean sea; and it seems to differ only in degree, from those more dreadful epidemics, whose ravages, at different times, have been so severely felt, throughout the greater part of the western hemisphere.

In a late publication, however, on the diseases of Sicily, and under the title of autumnal fever, the history of a disease is given, which, in some essential symptoms, differs considerably from that which I have now described. To this circumstance it, in this place, behoves me to advert. Had the author survived, it doubtless would not have escaped his notice. The service was prematurely deprived of his abilities; he is no more, and I shall not attempt to explain it. I respect his memory, and I admired his talents.

At a more advanced period of the season, the fever frequently assumes the intermittent type, and becomes continued after the second or third revolution. At other times, it occasionally also, though of the most continued form during the first and second days, and attended with symptoms of considerable excitement, readily intermits on the abstraction of a moderate quantity of blood; still, however, distinctly marked by its specific and peculiar signs, depending on local organic disease.

Those varieties are most frequently observed after the disease has prevailed some time, and are materially influenced by the changes which then take place in the sensible condition of the atmosphere, accompanying the regular revolution of the seasons, and are such as regard either its temperature or humidity.

In Sicily, this fever usually makes its appearance about the same time that cholera morbus and other disorders of the biliary organs are known to prevail, and both diseases seem to arise from causes nearly of a similar nature. It indeed appears to be essentially necessary to the production of this fever, that a considerable diminution of temperature, accompanied with much humidity of the atmosphere, should *suddenly* succeed to the long continued heat of summer. By those

causes, an important change is effected in the balance of the circulation, causing an unusual determination to the abdominal viscera, and producing congestion and inflammation of the hepatic system, in various degrees, followed by an increased and vitiated secretion of bile.

It is therefore on this change first taking place, that the fever is most severe, as well as most fatal in its tendency. It then assumes the most continued form, and the local symptoms are at this time also most violent, which seems to be owing to the intensity and sudden application of the cause; for, after its first effects have passed, and the body has for some time been habituated to an atmosphere of a much lower degree of temperature, the cases which follow are of a less formidable nature.

But whatever type this fever may assume, or how complex soever and involved its revolutions may appear, the local and characteristic symptoms are the same, and differ only in degree. This variety of type I am therefore inclined to consider rather as accidental, than as constituting any essential difference in the nature of the disease; which I conceive to be radically the same, and to be cured on the same general indications, which are directed solely to the relief of the local affection, and not to be regulated by any peculiarity of type the fever may put on.

As the disease always arises from local inflammation, the common circumstances which favour the production of all diseases of this class, are those which also tend to give it the continued form; while debilitating powers, within a certain limit, in proportion as they subdue the activity of the local inflammation, dispose the fever to remit, and, in many instances, even produce complete apyrexia. As I have already said, this is often effected by copious and early evacuation; while, on the other hand, stimulating medicines, or a few doses of bark, imprudently administered, increase the severity of all the symptoms, and produce a continued fever.

Though the young, plethoric, and robust are most subject to attacks of this disease; as far, at least, as I have had an opportunity of observing, persons who have but newly arrived in the island, about the time it begins to appear, are seldom

seized; though they are invariably most liable to suffer from summer fever, while those who have resided in the island during the preceding summer, are its common victims:—from which it seems highly probable, that, during the hot season, the rudiments of the disease are in some measure formed, and are called into action on the first approach of autumn, or in situations where the common exciting cause of this disease most usually prevails.

About the time this fever began to appear in the 62d regiment in 1811, a detachment of eighty recruits arrived from England. They were young and vigorous; they were subjected to the same mode of life, and lodged in the same buildings with those who had lived some years in this country; but among them not a single case of this fever made its appearance, and every man who was taken ill, had at least been twelve months in the island. From the time the fever assumed a decided character, which was about the 1st of September to the end of October, eighty patients were admitted into the Regimental Hospital, and very few indeed exceeded 28 years of age. Thirteen cases terminated fatally. It is, however, to be observed, that, among these, are included three patients who died after the third week from the date of their admission into the hospital, and who were carried off by a dysentery, supervening after the fever had been overcome.

Though bilious remittent fever is more particularly a disease of autumn, it is not only more predominant, but its appearance is also more early, in certain situations, whose local circumstances and topographical relations subject them more generally to the influence of similar changes of atmospheric constitution.

Thus, all situations in the vicinity of the coast, particularly such as are not much elevated above the level of the sea, independent of the proximity of marshes and exposure to putrid effluvia, are extremely favourable to the production of this disease. Few situations are more unhealthy than low grounds bordering on large *fiamave*, where they terminate in the sea; the waters of numerous springs, descending from the mountains, filtrae through the loose and stony soil, till they reach the bed of the cean. In such places, water may be found at

no great depth from the surface, by which the surrounding atmosphere, if not freely exposed to strong winds, is loaded with humidity; and diseases of the alimentary canal, arising from checked perspiration, are common. The disease was often produced among the soldiers by severe night-duty; and, not unfrequently, it was traced to exposure to a shower of rain. Much also depends on the nature of the prevailing winds; for those places which are exposed to winds, which blow over a vast tract of ocean, are always most unhealthy; and we observe, *cæteris paribus*, that the more elevated the situation, or the more remote from the sea, the more healthy is it found; as the vapour, with which these winds are saturated, is either intercepted by intervening obstacles, or absorbed on its passage over a scorched and arid soil. It has been remarked by Hippocrates, that westerly winds are most unhealthy; "venti enim occidentales similes autumno sunt."

I have never known an instance of its being propagated by contagion. In this country the *febrile diseases* of this class are very few, and, as far as my observation goes, are entirely limited to the exanthemata.

From every observation I have been able to make, and from the most careful attention to a vast number of cases of this disease, which have come under my care, in the course of five years practice in this country, as a regimental surgeon, I must acknowledge, how contrary soever it may be to generally received opinions, that I am not inclined to attribute much to the operation of what we commonly understand by *marsh miasma;* and I have not been able, in any case which I have seen, by direct or irrefragable proofs, to trace the origin of this fever to such a cause. Indeed, were the putrid effluvia of marshes so powerful, or the sole agent on this occasion, we should expect, that the intermittent form would have been most common at the time this cause is generally supposed to be most predominant, namely, during the time that rains were not yet exceedingly abundant; while, at the same time, the temperature of the atmosphere suffered only one transient diminution, being immediately again succeeded by intense heat. During this period, however, the disease was most severe, and also preserved the most continued form; and only

slight and obscure remissions were observed towards its termination;—for it was not until the weather had become finally settled, and permanently colder, and that the rains had totally ceased for several weeks, that the symptoms became milder, and the intermittent form more common.

Many, indeed, who have escaped from the more violent attacks of the disease, relapse in the month of December, and are then seized with obstinate intermittents. Such cases are generally accompanied by general dropsy or fatal dysenteries, produced by chronic diseases of the liver, spleen, or other abdominal viscera.

It is supposed, therefore, agreeably to the foregoing facts, supported by the evidence of numerous dissections, that certain diseases of those viscera are to be regarded rather as the origin and cause, than the consequence of this fever, under whatever variety of form it may appear; and it is not imagined that the enlargement of those viscera, so frequently observed in subjects who have suffered from repeated attacks of such fevers, affords any argument against the general doctrine which I have endeavoured to establish, but may, perhaps, be more rationally accounted for, by the successive repetition of some power, on whose casual application the chronic diseases of those parts assume a more acute form, at length producing total ruin of their structure, as well as increase of size.

The succession and order of the symptoms, marking the different stages and types of this fever, will be readily explained by the appearances on dissection, and seem to depend chiefly on the degree of inflammation and the sensibility of the part concerned. When the liver is very violently affected, the symptoms sometimes even resemble those of hepatitis, and which more especially appear at the commencement of the fever; and inflammation of the stomach is sufficiently characterized by the anxiety, restlessness, vomiting, and prostration of strength, which immediately follow.

As a common consequence of extensive peritoneal inflammation, we sometimes find a quantity of serum effused into the cavity of the abdomen, and various adhesions formed between its parietes and the contained viscera; and the omentum at other times so much wasted, as to resemble merely a tissue

of red vessels. The liver almost always exceeds its natural size, and is also considerably altered in colour and texture. It is always softer than natural; and the system of the vena portæ is always turgid with blood. The peritoneal covering of the liver is often thickened and opaque, and is sometimes studded with white spots, or with flakes of coagulable lymph. Sometimes its surface is irregular, and small indurated portions are discovered on its convexity; which, when cut open, are found to proceed from obstruction of some ramification of its excretory ducts, produced by inflammation of its coats, and favouring the accumulation of viscid bile. The coats of the cyst generally partake of the inflammation. The colour of the bile it contains is various, and it is sometimes so viscid and thick, that it can scarcely be forced out by strong pressure.

A remarkable alteration also takes place in the appearance of the spleen. It does not always, however, exceed the natural size, but its softness is often such, that it can only be compared to a mass of coagulated blood; while, at other times, it has an unusual degree of hardness, with thickening and whiteness of its peritoneal coat.

The stomach is as frequently found contracted and empty, or inflated with air, or distended with variously coloured fluids, and even pure bile. Sometimes, inflamed spots are discovered on its peritoneal coat; but the internal surface is the most frequent seat of disease. The texture of the villous coat is often completely destroyed, and it exhibits an uniform red, of the deepest hue, in several places approaching to a livid colour, and is covered with coagulable lymph, or a secretion of puriform matter tinged with blood. In other cases, the inflammation is more limited, and appears in rosy patches over its internal surface, or in numerous minute red specks.

This inflammation is never of the phlegmonous kind, but, like true erythema, successively invades one part after another, frequently creeping along the whole course of the alimentary canal, attended with thickening and pulpiness of its coats.

The brain and its membranes shew no uncommon appearances, or marks of previous inflammation.

The lungs are not affected; but I have often found a large quantity of serum, of a yellowish colour, collected in the

pericardium, while the heart seemed to have suffered from inflammation; and, in two or three cases, I observed white patches of coagulable lymph, apparently converted into firm glistening membrane, easily separated from its proper coats, on different parts of its external surface.

When this disease appears in a regiment, the utmost vigilance is required on the part of the military, as well as of the medical officers of the corps, to detect it in its early stage; for I know not an instance in which, after the third day, the best directed medical efforts were at all sufficient to arrest its course. I cannot, therefore, in this place, forbear mentioning, that it has been my good fortune to be surgeon to a corps, at all times commanded by an officer, from whose zeal and humane exertions I have ever received the most cordial assistance, whenever it had the misfortune to be visited by serious or epidemic diseases.

Such, indeed, is the rapid progress of the disease, and the great delicacy of the organ principally concerned, that our measures must necessarily be prompt and vigorous; and under whatever varieties it may appear, with respect to type, the local symptoms always require our first attention, and indicate the necessity of copious evacuation of blood. If the fever be of the continued form, under such treatment it very often becomes intermittent; and when of this latter form, we thereby prevent its being changed into a more dangerous type, in the course of its progress.

From the use of this remedy we are not always to be deterred by the smallness of the pulse; and even if deliquium should come on after the abstraction of a few ounces of blood, the operation may be repeated soon afterwards, without the occurrence of the like accident.

The indiscriminate use of the term *debility*, derived from some of the more general phenomena of disease, without regard to its essence or cause, has led into egregious error in the treatment of this, as well as of some other complaints, which are commonly considered as simple idiopathic fevers. The anxiety, languor, restlessness, and prostration of strength, which accompany this epidemic, are not symptoms of debility, but of gastritis, and depend on the peculiar structure of the

organ, and its extensive sympathy with the whole system. A free use of the lancet is required; and, in order that this remedy may be productive of beneficial effects, it must be had recourse to at an early period of the disease. Even when the disease was too far advanced for any permanent advantage to be expected from venesection, its effects have been discovered by a temporary increase of fulness of the pulse. What is here said, applies equally to general and local bloodletting; and this last mode may be employed with considerable advantage.

In the inflammation of all delicate and highly sensible membranes, unless we succeed in the first instance, we in vain attempt to subdue it afterwards, by acting on the arterial system at large, and still further diminishing the *vis à tergo:* for the disease makes rapid progress; the texture of the organ is speedily destroyed, and its vitality is irrecoverably lost.

Recourse must, therefore, at the same time, be had to such means as possess some control over the vessels of the part, suitable to its peculiar functions and organization; and the effects of local bloodletting, by the application of a number of leeches to the region of the stomach, are to be further assisted by large and repeated blisters.

Nothing so much aggravates all the symptoms, as the presence of acrid bile, and accumulated feculent matter. All irritation, therefore, from such causes, is to be carefully prevented; and, with this view, the contents of the intestines are to be dislodged on the first approach of the disease, and their accumulation cautiously guarded against during its continuance. For this purpose, small doses of purgative medicines must be frequently administered. It too often happens, however, that the irritability of the stomach is such, that medicines of this class cannot be retained, but are instantly rejected; and recourse, therefore, must also be had to large emollient and laxative clysters, which must be frequently injected, and are, in all stages of the fever, of the most essential service. As a purgative, no medicine is so well adapted to this complaint as the sub-muriate of mercury; and its operation may be sometimes advantageously alternated with the use of sulphate of magnesia dissolved in water, and plentifully diluted.

The effects of mercury, however, are not to be estimated solely by its purgative quality; but it seems to be chiefly useful, on account of its specific action on the hepatic system, and its power of affecting, through the medium of the circulation, secreting surfaces endowed with high irritability, and in a state of inflammation. This remedy is, therefore, to be used externally, as well as internally; and is to be resorted to immediately, as the most powerful remedy we possess in the treatment of this disease. Its effects, however, do not always depend on the quantity introduced; but on certain conditions of the system, by which the latter is rendered more or less susceptible of its action, and which I do not pretend to explain.

This susceptibility is indicated by the effects produced on the salivary glands; some degree of ptyalism follows, which affords the surest prognostic of a favourable termination; and the change produced in all the symptoms is generally quick and rapid. It sometimes, however, happens, that the largest doses will not produce salivation, and, in such cases, the event is invariably fatal.

From the rapid manner in which we are frequently induced, on account of the severity of the disease, to introduce this medicine into the system, copious salivation is frequently occasioned, and often appears suddenly, with bleeding from the gums; but, as no advantage is to be expected from the mere secretion from salivary glands, I have succeeded equally well, after having ascertained its influence over the disease, by continuing its use in small doses, merely sufficient to keep up the mercurial irritation in the system, until the disease was completely overcome. From what has been said, it needs scarcely be observed, that the practice of besmearing the gums with mercurial ointment, or rubbing them with calomel, for the purpose of encouraging this secretion, is extremely ineffectual.

Sometimes severe diarrhœa comes on during the early stages of recovery, attended with want of sleep; in which case, I have derived the greatest advantage from small doses of opium, combined with calomel. It is, however, to be remembered, that under no other circumstances whatever, is opium to be recommended in this disease.

As far as I have had an opportunity of observing, cold effusion does not appear so well adapted to this species of fever, as to that which prevails during the summer. Indeed, if the external use of cold water can ever be recommended in this fever, it promises to be most successful in those cases which show a more decided tendency to assume the intermittent form, when they happen to be occasionally attended with some degree of determination to the head. Under such circumstances, I have frequently employed it in the manner of cold ablution, during the hot stage, with manifest advantage. From a few trials I have made of the tepid bath, during the second stage of the disease, I am inclined to think it may sometimes be employed with advantage.

The alternation of these remedies has lately been practised and recommended by some physicians; and something of the same kind is also mentioned by Celsus,* from whom, perhaps, the idea has been borrowed. Of such practice, however, I cannot speak from experience.

Attention ought also to be paid to the regular discharge of urine, which is sometimes scanty; and though secreted by the kidneys, is not duly evacuated;—for which purpose, therefore, I have often been obliged to have recourse to the catheter.

We are usually advised, in *all* fevers which show a tendency to intermit, to watch this period carefully; and to avail ourselves of the earliest opportunity such circumstance affords, of exhibiting bark in large doses, with a view to obviate the *debility* which, it is said, predisposes to the formation and return of another paroxysm. That in *some* fevers, and in certain habits and constitutions, this may be highly expedient and advisable, I do not venture to deny, as such practice stands supported by the best authority, and is justified by ample experience.

Without entering, however, into an examination of the above principles, which generally direct its use, I feel myself warranted to affirm, from the result of several cases in which this plan was adopted, in *the fever now under consideration*,

* Celsus, lib. i. 4. and iv. 2.

that bark served only to exasperate the local disease, and to aggravate every symptom of the succeeding paroxysm.

In many cases which occurred towards the final cessation of the epidemic, at the close of the autumnal season, the local symptoms were much milder, and the fever became intermittent, after a moderate evacuation of blood, and a free use of laxative medicines. In those cases, calomel was the medicine I chiefly employed; and I almost invariably observed, that, when carried to an extent sufficient to manifest its action on the system by the usual criterion, the paroxysms soon after ceased to return.

When relapses occur, and the strength is at length a good deal exhausted, it becomes necessary to support the patient under the action of the mercury (which must be given in small doses), by a nourishing diet and the use of generous wine. Bark then becomes an useful auxiliary; and warm clothing, gestation on horseback, and change of scene, greatly facilitate the recovery.

SELECTED REVIEWS.

An Introduction to Medical Literature; including a System of Practical Nosology: Intended as a Guide to Students, and an Assistant to Practitioners. By THOMAS YOUNG, M. D. F. R. and L. S. Fellow of the Royal College of Physicians, and Physician to St. George's Hospital. 8vo. pp. 602. London. 1813.

[From the London Quarterly Review, for March 1813.]

AT a time when so much discussion has been provoked, and such activity displayed in pursuit of the best method of instilling the rudiments of grammar and arithmetic, we cannot but persuade ourselves that a proportionate ardor will be excited by every endeavour to improve the higher branches of knowledge, and to diffuse the elements of more exalted science. In this latter class medicine holds a distinguished rank —whether we consider the enlarged field of information on which it is raised, the numerous subjects for reflection which it comprehends, or the beneficial application of its powers to the comfort and continuance of life. Under these impressions, we are confident that we are performing an acceptable service in accommodating ourselves to the prevailing taste, and in calling the notice of our readers to Dr. Young's recent work on the literature and study of medicine. A brief description of the object and execution of this publication will be no less interesting than useful, and we shall exhibit the author's views and intentions in his own words.

'In a science so complicated and obscure as that of physic, the want of some direction for the assistance of a student has been the more felt, as the difficulty of the execution of such a work has been greater.'—'In no department of human knowledge is the work of literary discrimination more necessary than in physic; in none is it more difficult, and in none has it been more neglected, at least in this country.—The non-existence of any work in the English language, resembling that which is now offered to the public, while the subject is of the most undeniable importance, must be admitted as an apology

for its appearing with many imperfections in some degree inseparable from the nature of the undertaking.' 'The collection of literary information, and of references to various authors, is a step which ought always to be preliminary to the execution of a detailed treatise on any department of science. Having completed this collection, I have been principally induced to lay it separately before the public, by the approbation which has been bestowed on the second volume of my lectures on Natural Philosophy, consisting principally of a similar methodical catalogue of the literature of all the subjects which had been explained in an elementary manner in the first volume.' 'To assist in furnishing the student with a sufficient direction for cultivating any particular department of his profession, in the most advantageous manner, is the principal object of this work.' Pref. pp. 3—8.

Medical education amongst us is carried to the highest perfection, as far as regards the assistance to be derived from lectures and hospitals; but there has always been wanting a guide in the closet, a director in literary research. It is no less true than strange, that no attempt to supply this deficiency should have been made before; and that, while the acquirement of the other learned faculties, as well as of moral and political, metaphysical and natural philosophy, has been facilitated by the aid of the most distinguished ornaments of those professions and sciences, physic alone should have been suffered to remain unassisted, in this respect, by any of its professors, in a country so justly celebrated for its medical attainments. The work before us will remove the stigma, and complete our system. It is not, however, to the student alone, that this introduction will be found of use, it will prove equally serviceable to those far advanced in knowledge. The mere perusal, indeed, of the catalogue of references, will often be alone sufficient to awaken recollection, by reviving the trains of interrupted impressions, through the association of system, or the influence of names; and of such an auxiliary, practitioners, from the nature of the science, are continually in need.

Preparatory to directing the student in his medical duties, Dr. Young has with great propriety called his attention, in a preliminary essay, to the general education upon which those

studies must be engrafted; to the professional expectations which may reasonably encourage his pursuits, and to the moral and intellectual qualifications required to attain the objects of his ambition. The principal part of this essay consists of an elegant translation of a work by Professor Vogel, enlarged and illustrated by the reflections of the author. This dissertation abounds with useful instruction and strong sense. The character of the science and profession of physic here delineated, inspires us with exalted notions of their excellence, when carried to the perfection thus prescribed.

'Medicine not only comprehends so very extensive a range of knowledge, but its truths are often so profound, and so much concealed from a cursory inspection, so intricate, so much disguised, distorted and obscured by a multitude of delicate and invisible causes, that nothing less than the all-commanding eye of the most enlightened understanding, than the all-penetrating and all-searching power of genius, can possibly recognise that which is hidden in darkness, can follow that which is remote into the last traces that it imprints, can distinguish certainty from opinion and probability, can separate the essential from the accidental, and finally can analyse and develop any subject of investigation so completely, as to leave no further doubt respecting any of its properties, which are cognisable by human means.'—Prelim. Essay, p. 7.

'Perhaps there is no science which requires so penetrating an intellect, so much talent and genius, so much force of mind, so much acuteness and memory, as the science of medicine. For the full attainment of its proper and ultimate object, it requires also, indispensably, the possession of stability of judgment, rapidity of decision, and immoveable firmness and presence of mind, readiness of recollection, coolness, flexibility of temper, elegance and obsequiousness of manners, and a profound knowledge of mankind, and of the secret recesses of the human heart.' p. 9. 'These qualifications can only be obtained by means of a good education, united with opportunities of becoming acquainted with the world, and habits of intercourse with society.'

The course of general and of medical education here laid down, as necessary to be pursued, coincides so nearly with

the present general practice, that it will be readily admitted to be right. In conclusion we are furnished with a demonstrative refutation of some opinions published by Dr. Brown, in discouragement of our reliance upon the efficacy of medical practice.

'This discussion appeared essential, since, if it were true that the medical science of the most celebrated professors could effect so little, under circumstances so favourable as he has supposed, the public would have scarcely any motive left for encouraging a pursuit so fruitless, nor an individual for devoting himself with zeal and enthusiasm to the attainment of knowledge, where nothing further than doubt and difficulty could reasonably be anticipated.' p. 25.

We come now to the body of the work. Medical literature is very extensive; and to render so large a collection manageable by a student, it requires to be reduced and distributed into systematic order. Here peculiar difficulties occurred, 'since there is no science in which selection is so important and so difficult.' p. 43. One cause of this difficulty is the state of medical literature, which, for the most part, is either desultory and detached, or involved in artificial and erroneous combinations. To combine the one and disunite the other requires infinite labour and research. The author appears to have been very attentive to the difficult task of selection, 'having inserted no books but such as he conceives to be necessary to a complete medical library.' Pr. p. 11. These have been chosen for their reputation, authority and usefulness. To the titles of the most important is often adjoined a concise critique upon the merits of the work, a short account of its contents, and a distinguishing mark expressive of its relative value in a course of study. Having finished the selection, the next proceeding, to fit it to use, was the arrangement of the subjects into their respective parts. Without the employment of a philosophical method, the collection, however ably selected, would have continued inaccessible to a student, and the catalogue have conveyed no further information than those of the same kind which have been published on the continent. The greater part of these, which profess to be guides to medical literature, scarcely answer this purpose better than the digested cata-

logue of a medical library, as disposed for sale. What was required was a dictionnaire raisonné; and this the author has furnished. We find his ingenuity here applying a precision, almost mathematical, to an extensive yet minute classification; so that the enquirer is enabled, by the natural dependence of the distribution, to obtain information upon any single point of medical science. The force of this arrangement may be regarded in the same light as the geometrical aids employed in geography, which empower us to lay our finger upon the most insignificant spot upon the surface of the globe; and thus facilitate our investigations into its history and nature, its relations and its use.

The first department of this distribution is allotted to works on medical literature in general, and is divided into eleven sections. The plan then breaks into certain general classes, disposed according to their natural sequence. 1st. Those works which treat on the properties of matter in general, or on chemistry. 2d. On the arrangement of matter in the structure of the body, or on anatomy. 3d. On the functions or intentions of that structure, or on physiology. 4th. On the disorders of that structure, and of those functions, or on pathology. 5th. On the removal of those disorders, or on therapeutics.

In the system, or rather systematic nomenclature, of chemistry, the author has availed himself of all the new lights which have been thrown upon this branch of philosophy, by the discoveries and arrangement of Sir H. Davy, in his late illustrations of electrochemical science. This compendium contains a brief abstract of the objects, laws and combinations of chemistry in its most improved state.

The divisions of anatomy have been always fixed and certain, being determined by the different component parts of the body, and are distinguished here by the usual titles of osteology, myology, splanchnology, dermatology, angiology, and neurology. To assist the memory upon these points, tables of their respective subjects are introduced.

Physiology, having for its object the explanation of the functions of the parts enumerated in anatomy, divides itself, of course, into similar heads; and is distributed into classes

relating to the office of the nerves, bones, muscles, vessels, and viscera.

The division which succeeds, as it is the largest of the whole, and most applicable to medical instruction, seems also to have most engaged the author's attention; and to bear, in consequence, the strongest marks of the exertion of industry and genius. After a few sections upon points connected with general pathology, we are presented with a new system of nosology. For this innovation, satisfactory reasons are adduced in the Preface. The necessity of departing from the system of Dr. Cullen, which has been most generally received, is there made apparent; and the omission of every other which has since appeared is sufficiently justified. In the construction of a new system, the author has conformed himself 'to the strict rules of Linnæus, notwithstanding the irregularities which embarrass the classification of diseases.' Pref. p. v. To enable the reader to ascertain the preciseness of this accommodation, and at the same time to put him in possession of a treatise of much general application to philosophical arrangements, the author has furnished him with a translation of great part of the Philosophia Botanica of Linnæus. Notwithstanding the ability manifested in this part of the work, Dr. Young does not arrogate to it any undue importance. He seems sufficiently aware, that systems of nosology are little better than technical aids. He will not dissent from our opinion, that they afford but little elucidation to pathology, and are most serviceable in assisting the memory and facilitating research. How little applicable the distinctions of sytematic arrangement are to the varieties of disease, in comparison with other objects of science to which they have been attached, is evident from the following declaration:

'It is true, that we must not expect the same rigid accuracy in medicine, that may be obtained in some of the departments of natural history; since, in fact, many of the distinctions which are required in a nosological system, are rather established for the sake of practical convenience, than strongly and immutably characterized by nature.'—Pref. p. iv.

The body is not composed, like the objects of chemistry, natural history, or abstract science, of independent forms and

members—it is one whole; it lives and suffers as a whole, and cannot be separately and unconsciously injured in any part. It is impossible therefore, strictly speaking, for any part to sustain an individual disease. If one member be disordered, the rest will be reciprocally affected. A sympathetic connection unites all divisions and systems of the human frame. Like joint-tenants, all the component members hold a communion of interest, and affection and power, not separately and individually, but 'per my, et per tout.'*

For the particulars of this reformed system of nosology, we must refer our readers to the work, as it is too extensive for recital, and yet too concise for abridgment. We shall content ourselves with enumerating the titles of the classes and orders.

Class I. Paraneurismi. Nervous diseases. (Consisting chiefly of the Neuroses of Cullen.)

Class II. Parhæmasiæ. Sanguine diseases.

Order 1. Phlogismi. Flushes. (Chiefly simple inflammations.)

Order 2. Pyrexiæ. Fevers.

Class III. Pareccrises. Secretory diseases.

Order 1. Epischeses. Retentions of various kinds.

Order 2. Apocenoses. Effusions of secreted fluids.

Order 3. Cacochymiæ. Cachexies, or vitiated secretions, (as dyspepsia, podagra, diabetes.)

Class IV. Paramorphiæ. Structural diseases.

Order 1. Paraphymata. Local changes, (for instance, tumours.)

Order 2. Epiphymata. Eruptions, (chiefly cutaneous.)

Class V. Ectopiæ. Displacements, (including surgical and obstetrical cases.)

The genera, species, and varieties, are equally extensive and defined. From a due examination, it will appear, that this is the most exact and practical nosology which has hitherto been submitted to public attention. The merit of this system consists, not merely in the absence of the objectionable parts of that of Dr. Cullen, but in the incorporation of Dr. Willan's

* Blackstone, Vol. II. p. 182.

valuable nosology of the skin, and in the addition of a great variety of diseases hitherto confined to chirurgical collections. That imperfections should still remain amidst so much improvement, is not altogether chargeable to the author. 'Many are inseparable from the nature of the undertaking,' others depend upon the progressive and defective state of the science, and some will give way, under more favourable circumstances than a first essay, to future correction. We have an earnest of this last expectation, in the numerous amendments introduced by the author into his present system, since it was first published in his syllabus of a course of lectures, for which it was prepared: and we will even venture to suggest to him, that a little more equality in the allotment of his references would be a material improvement in a future edition; several diseases of considerable importance being dismissed with very slight notice, while others, comparatively insignificant, are almost overwhelmed with a profusion of authorities. The author has arranged the different accounts which have been given of the yellow fever, under three different genera, cauma, synochus, and anetus; we are rather disposed to believe that the disease is always essentially the same, and dependent on paludal effluvia. He has followed Dr. Crichton in suppressing the order of the exanthemata; an innovation, which has produced some difficulty in the arrangement of scarlatina, measles, and smallpox; diseases which certainly do vary in the type of the fever attending them, in such a manner, as to require some other generic character, than can be derived from the nature of that fever alone; we do not deny that some of these difficulties are almost unavoidable; but we trust that something more may hereafter be done for overcoming or diminishing them, than our author has hitherto effected.

The remaining division of the work, referring to the means to be used for the removal of disorders, differs but little in its arrangement from that which is usually admitted into all later systems of therapeutics. The subdivisions are established upon the acknowledged agency of pharmaceutical means. Posology has been usefully annexed to this part of the subject; and there are added, as intimately connected with pharmacy, the very ingenious tables of chemical affinities, constructed by

Dr. Young, and already published in the Philosophical Transactions.

The extensive range of the author's literary attainments has enabled him to give us a translation of some of the Swedish works of Professor Berzelius, upon animal chemistry, and the laws of chemical combinations. This compendium contains the chief of what has been discovered upon the subject, so interesting and important to a medical philosopher. The authorities upon which the facts and opinions rest are historically detailed, together with the corrections afforded by the arguments and experiments of the professor, and the discoveries which he has made in this department of chemistry. The name of Berzelius is a sufficient surety of the value of this treatise.

Two essays, by the author, close the volume; the first containing remarks on the measurement of minute particles, especially those of blood and pus, and the last on the medical effects of climates.

The observations and discoveries in the former are not only relevant and subservient to physiology, but, in a more especial manner, to pathology, by the suggestion of an easy mode of distinguishing morbid from natural secretions. It has always been a desideratum with medical practitioners to obtain some test of the difference between pus and mucus; as being the products of different states of the secerning vessels. Most of the chemical methods, which have been pointed out, have been found in practice insufficient or inconvenient. Dr. Young, however, has invented an optical test of a decisive power, and of easy application. The optical discoveries which led to this invention, and to the present observations, were read before the Royal Society in July, 1802, from a paper by the author, entitled, 'An account of some Cases of the production of Colours, not hitherto discovered.' Having given a test, 'applicable to all cases of minute particles held in suspension in transparent fluids,' he proceeds to observe, that

'Where the greater number of the particles are nearly equal in dimensions, a luminous object, viewed through them, is surrounded by rings of colours, somewhat resembling those of the rainbow, but differently arranged, and often beautifully brilliant. The blood, a little diluted, always exhibits them in

great perfection, and they afford a very accurate criterion for the distinction between pus and mucus. Mucus, containing no globules, affords no colours, while those which are exhibited by pus exactly resemble the appearance produced by the blood, the rings being usually of the same dimensions.' 'A minute quantity of the fluid, to be examined in this manner, may be put between two small pieces of plate-glass, and if we hold the glass close to the eye, and look through it at a distant candle, with a dark object behind it, the appearance, if the globules are present, will be so conspicuous, as to leave no doubt respecting their existence.'—P. 547.

This discovery he has further improved, by rendering it applicable to the measurement of the fibres of the wool, hair, and other substances employed in manufactures; the construction of an instrument for this purpose is next described, and its uses explained. These principles and optical observations are employed also for the solution of some microscopical, optical, and meteorological phenomena.

The essay ont the medical effects of climates, will be read with equal eagerness and advantage by medical practitioners, and by those whose health requires them to consult the means of obviating the effects arising from the variableness of the weather. It contains all that can be said for their information in a medical point of view, and is replete with judicious remarks. These are grounded on philosophical observations, and are urged with much force.

The stile throughout is clear and polished; refined without affectation, and easy without the sacrifice of dignity and correctness. It may be regarded both as an example and incitement to the introduction of a more finished mode of writing in medical compositions. We are not pronouncing too favourably of this work, when we express our confidence that, stored with such valuable learning and information, and enriched with such advantages of method and composition, it will not only be resorted to as a direction to students, but will find its way, as a book of reference, into the hand of the enlightened physician. It is no less a guide to youth, than a staff to age; and both descriptions of practitioners are under great obligations to the author for this productive effort of talent, labour, and erudition.

ORIGINAL PAPER.

TO THE EDITORS OF THE ECLECTIC REPERTORY.

The following case is sent for insertion in the Eclectic Repertory, if it shall be deemed worthy of a place.

I am respectfully,

Your obedient servant,

PEACHEY HARRISON.

Case of a Wound in the right Shoulder, inflicted with a pointed instrument.

SEPTEMBER, 22d ultimo, was called to see Benjamin Erwin, jun. on account of a wound which he had, a few days before, received in his right shoulder, near the end of the acromion process, and which had been inflicted with a pointed instrument, and had become extremely painful. I found, however, the wound nearly cicatrized, and the swelling inconsiderable. I advised for the present, the application of large warm poultices to the shoulder and arm; and as he was somewhat feverish, gave him a purge of sulphate of soda; and after the operation was over, directed sufficient doses of laudanum to be given to alleviate his pain. Previously to my seeing him, he had been bled, had used the general warm bath, and topical fomentations.

23d. Am informed, that yesterday the purge had operated moderately, but that towards night, some difficulty of swallowing had occurred; that, however, he had been easier and rested better during the night than he had done for several nights before; that his difficulty of deglutition was considerably increased this morning. From what I could collect from the messenger, (for I did not see him to-day), relative to the state of his throat, I supposed his difficult deglutition to be owing to the common inflammatory angina, and advised a puke, detergent gargles, and a blister to the throat.

24th. Was requested to see him early in the morning; found him complaining but little of his shoulder, but totally incapable of swallowing. Am informed he had not swallowed a drop of

any thing since midnight. There was no external swelling; his tonsils were slightly inflamed, but not at all enlarged; far back, about the commencement of the pharynx, an erysipelatous appearance was discernible. His speech was scarcely intelligible, and several violent attempts to swallow, were ineffectual. Complained of no pain, but of great heat at the stomach, attributed to a want of dilution;—observed his eyelids to remain half shut; and, upon inquiry, was informed, that an entire inability to move them took place soon after difficult deglutition. I observed to him, that his not being able to swallow, was owing either to a palsy of the parts concerned in deglutition, or to a closure of the œsophagus from inflammation:* he immediately remarked, and with good sense, that it must be owing to the former, for he could not at all move the parts concerned in deglutition. With a view to satisfy my mind on this subject, having tied some soft rags on the end of a limber rod, I passed it down his throat, but with an obvious resistance in the upper part of the œsophagus. Shortly after the mop was withdrawn, I desired him to try to swallow some water, which, to his great joy and surprize, he effected without much difficulty. He declared, that he felt the most agreeable sensations from the cooling effects of the water in his stomach. Just before that, being asked whether he was much thirsty, he replied, (looking round at a pail of water standing on the table), he "felt as if he could drink the whole of it." After the lapse of some little time, another attempt to swallow was ineffectual: but his throat being again *swabbed*, he was again enabled to swallow. And thus, he was enabled to swallow for twenty-four hours, by first using the mop; frequently, however, he was obliged to use it a second time before he could swallow. In general, he swallowed nothing but cool water; for, as it was with much trouble he swallowed at all, and his thirst being always great, he appeared unwilling to waste his endeavours to swallow any thing that would not satiate that appe-

* I am aware, that it will occur to the medical reader, that the inability to swallow, in this case, might have been, and probably was, owing to what surgeons have denominated, a *stricture* of the œsophagus; but after he has seen the issue of this case, his opinion will not, I am persuaded, differ from mine.

tite. Two or three times in the day, however, he was prevailed on to swallow some coffee, and he made some attempts to take a camphorated julap, with nitre and tartar emetic, but could not be persuaded to continue it, nor even to moisten the mop with it, before its introduction,—not that he was averse to the taste, but appeared to be afraid that it would, by getting into the wind-pipe, produce strangulation; and indeed his fears were not without foundation; for, in several attempts to swallow, this had happened, and had excited much distress. His pulse becoming full and hard towards evening, blood was let to sixteen ounces, which exhibited a strong buffy coat. A large blister had been drawn the night before, on his throat.

25th. The resistance to the passage of the mop is obviously increased, and seems to be in a progress downwards. The erysipelatous appearance in the fauces is no more discernible; has no pain; possesses no control over the organs of deglutition, except for a very short space, after motion has been given to them by the introduction of the mop. Towards evening, however, the closure of the œsophagus has been such, that he can no longer swallow by means of the mop. We now formed a leathern tube, about nine inches long, which being passed down his throat, (which was effected with the utmost ease), conveyed to his stomach any quantities of liquids it was thought proper to inject, by means of a large sponge. This evening, his pulse rising again to considerable fulness, he is bled to sixteen ounces, which exhibits no buffy coat.

26th. Last night, was very restless. To-day, the introduction of fluids into the stomach, by means of the tube and the sponge is difficult, owing, it is supposed, to the tube being too short to convey them beyond the constriction of the œsophagus; and their consequent regurgitation upon the larynx, induced very alarming strangulations. Since yesterday, no attempts have been made to give him any medicines. What we had now chiefly in view, was, to sustain the system by drinks and nourishment, and commit to nature the assistance of diseased action. From the state of the pulse, I was persuaded that the further use of the lancet was prohibited. It was generally agreed by his attendants, that, for the last twenty-four hours, he had a sufficiency of drinks and of nourishment,

chiefly chicken-broth, in which bread had been boiled, and the whole afterwards strained, to sustain life very well. This evening, with a view to relieve his sense of choaking, he passes the mop down his throat every few minutes, which finds a strong resistance just within the cavity of the breast. Can no longer articulate so as to be understood, and now writes down on a slate, without seeing it, whatever he wishes to communicate. Has something of a strangury.

27th. Complains of a numbness in his limbs, which are obviously paralytic. The tube and sponge are used to-day with less inconvenience than yesterday, and he continues to use the mop frequently, to relieve the sense of choaking.

28th. A mortification is announced, by an extreme fœtor of the breath, and other symptoms usually accompanying a putrescent state of the system; and he expired about five o'clock, P. M. without a struggle, and in his perfect mind. Shortly after his death, his neck and breast were covered with livid spots.

This case is precisely similar, in the main particulars, to that of Gordon, published in the 11th number of the Eclectic Repertory, only that the paralysis was partial at first, being entirely confined to the upper eyelids, and when on the day before his death it became general, it was incomplete.

That the œsophagus may be liable to inflammation, as well as other hollow muscles of the human body, will not, I should suppose, be questioned; and that this case and that of Gordon, are instances of *œsophagitis*, will hardly be doubted; but, that cases of this kind are rare, is, I think, inferrible from the silence of Cooper, in his Dictionary of Surgery, and of Professor Munro, in his work on the Morbid Anatomy of the Alimentary Canal. The œsophagus is mentioned by the former, as being incident to stricture and paralysis, and by the latter as being liable to stricture and spasmodic contraction, of which the accession, the progress and the termination, would be different from the case above detailed.

Whether this case was the consequence of a metastasis of inflammation from the wounded shoulder, as the friends of the patient generally supposed, I will not undertake absolutely

to determine; but am inclined to think, that it was induced by imprudent exposure of his neck and breast, after bathing and fomentation, during the night preceding the accession of the œsophagitis. His attendants observed to me, that he could not be induced, after emerging from the bath, to remain in bed, nor to be closely covered with a blanket. I will only further observe, that from the facility with which the tube was used in this case, it might be applied, I am entirely of opinion, with much convenience and safety, to the introduction of medicines and aliments into the stomach, in a great variety of cases, where they could not be swallowed by the patient: such as asphyxia from drowning or otherwise, in syncope, and where there is an aversion to particular medicines.

Head of Cook's Creek, near Harrisonburg,
Rockingham, (Virginia), November 4th,
1813.

ORIGINAL REVIEWS.

Description of the Retreat, an institution near York, for insane persons of the Society of Friends. Containing an account of its origin and progress, the modes of treatment and a statement of Cases. By SAMUEL TUKE. *With an elevation of the Building.* Pages 144, 12mo. Published by ISAAC PEIRCE, Philadelphia, 1813. From the 4to London Edition of 1813.

THE following extracts from the author's preface will serve to give an idea of his motives for this publication.

"At the present time, when a considerable degree of interest is excited respecting the treatment of insane persons, and when the government of our country has recently made it a subject of legislation, it is presumed that any account of existing institutions, which may throw light on the method of treating this deplorable class of our fellow creatures, will not be unacceptable to the public."

"Contemplating the loss of reason as pre-eminent in the catalogue of human afflictions; and believing that the experience of the Retreat throws some light on the means of its mitigation, and also that it has demonstrated, beyond all contradiction, the superior efficacy, both in respect of cure and security, of a mild system of treatment in all cases of mental disorder, an account of that experience has long appeared to me due to the public."

"It is much to be regretted, that we possess so few accounts of the mode of treatment, and the success of establishments, for the relief of insanity. The want of facts relative to this subject, and our disposition to hasty generalization, have led to many conclusions, equally unfriendly to the progress of knowledge, and the comfort of the patient."

"The interests of humanity and science alike call upon us to communicate freely the discoveries we make, or the failures which happen to us, in a pursuit so intimately connected with the happiness of our species. If persons engaged in the management of the insane, were more generally to publish the result of their observations, we might reasonably hope that the

causes of this obscure and affecting disorder would receive some illustration. We might at least confidently expect to ascertain, with greater precision, its general laws; and, from a comparison of the modes and success of various establishments, should be able to infer the most probable means of rescuing, or relieving the unhappy victims of this disease."

We cannot but cordially subscribe to these sentiments, and at the same time express our wishes, that this interesting subject may engage the attention of our medical brethren; looking forward to as complete a change in the treatment of the insane, as has been experienced in the case of criminals, to whom this suffering part of our fellow creatures have been too much approximated.

In the two first chapters an historical account of the institution is given, followed by a description and appropriation of the grounds and house. Here the comfort and pleasant accommodation of the patients are consulted. The medical treatment follows; for a fuller account of which, as well as of the moral treatment, we refer generally to our second volume, No. V. for October, 1811, where Hints on the Treatment of Insane Persons, written by the author, before the publication of the present work, are introduced. A few extracts, however, *respecting the insensibility of the insane* are worthy our attention.

"It will be proper to observe, that the experience of the Retreat fully confirms the opinion of several respectable modern writers, that maniacs are by no means exempted from the common effects of cold: and it is to be hoped, for the sake of humanity, that the opposite opinion, alike barbaroûs and absurd, will be entirely exploded. The apothecary to Bethlem hospital, after stating that the patients are not exempt from the usual effects of severe cold, observes very justly: "from the great degree of insensibility which prevails, in some states of madness, a degree of cold would scarcely be felt by such persons, which would create uneasiness in those of sound mind; but experience has shown that they suffer equally from severity of weather. When the mind is particularly engaged on any subject, external circumstances affect us less than when unoccupied. Every one must recollect, that, in following up a favorite pursuit, his fire has burned out without his being sensible of

the alteration of temperature; but when the performance has been finished, or he has become indifferent to it from fatigue, he then becomes sensible to cold, which he had not experienced before."

"The supporters of the absurd notion respecting the capacity of maniacs generally to resist the action of cold, also observe, that insane persons commonly endure hunger without injury. The latter sentiment is no less at variance with the experience of the Retreat than the former. Some of the patients, more especially the melancholics and convalescents, besides their four usual meals in the day, require the intermediate refreshment of biscuit, with a glass of wine or porter; and attention of this kind is considered almost essential to the recovery of many patients."

"General propositions," says Dr. Pinel, "have been too often advanced in regard to the capacity of maniacs to bear extreme hunger with impunity. I have known several, who were voracious to a great degree, and who languished, even to fainting, from want or deficiency of nourishment. Unhappy experience, which I acquired during seasons of scarcity, has most thoroughly convinced me, that insufficiency of food, when it does not altogether extinguish the vital principle, is not a little calculated to exasperate and prolong the disease."

"Insane persons generally possess a degree of control over their wayward propensities. Their intellectual, active and moral powers, are usually rather perverted than obliterated; and it happens, not unfrequently, that one faculty only is affected. The disorder is sometimes still more partial, and can only be detected by erroneous views, on one particular subject. On all others, the mind appears to retain its wonted correctness."

The author divides the moral treatment of the insane into three parts.

I. The means of strengthening and assisting the power of the patient to control the disorder.

II. The modes of coercion to be employed, when restraint is absolutely necessary.

III. The means of promoting the general comfort of the insane. "It is wise to excite as much as possible the operation

of superior motives; and fear ought only to be induced, when a *necessary* object cannot otherwise be obtained."

The following striking example of the power of self-control is related.

"Some years ago, a man, about thirty-four years of age, of almost Herculean size and figure, was brought to the house. He had been afflicted several times before; and so constantly, during the present attack, had he been kept chained, that his clothes were contrived to be taken off and put on by means of strings, without removing his manacles. They were, however, taken off, when he entered the Retreat, and he was ushered into the apartment, where the superintendants were supping. He was calm; his attention appeared to be arrested by his new situation. He was desired to join in the repast, during which he behaved with tolerable propriety. After it was concluded, the superintendant conducted him to his apartment, and told him the circumstances on which his treatment would depend; that it was his anxious wish to make every inhabitant in the house as comfortable as possible; and that he sincerely hoped the patient's conduct would render it unnecessary for him to have recourse to coercion. The maniac was sensible of the kindness of his treatment. He promised to restrain himself, and he so completely succeeded, that, during his stay, no coercive means were ever employed towards him. This case affords a striking example of the efficacy of mild treatment. The patient was frequently very vociferous, and threatened his attendants, who, in their defence, were very desirous of restraining him by the jacket. The superintendant, on these occasions, went to his apartment; and though the first sight of him seemed rather to increase the patient's irritation, yet after sitting some time quietly beside him, the violent excitement subsided, and he would listen with attention to the persuasions and arguments of his friendly visitor. After such conversations, the patient was generally better for some days or a week; and, in about four months, he was discharged, perfectly cured."

"Can it be doubted, says the author, that in this case, the disease had been greatly exasperated by the mode of management? or that the subsequent kind treatment had a great tendency to promote his recovery?"

The following important observations on this subject, we trust, will be duly appreciated.

"Nor must we forget to call to our aid, in endeavouring to promote self-restraint, the mild but powerful influence of the precepts of our holy religion. Where these have been strongly imbued in early life, they become little less than principles of our nature; and their restraining power is frequently felt, even under the delirious excitement of insanity. To encourage the influence of religious principles over the mind of the insane, is considered of great consequence as a means of cure. For this purpose, as well as for others still more important, it is certainly right to promote, in the patient, an attention to his accustomed modes of paying homage to his Maker."

Respecting the modes of coercion we are told, that "coercion is considered, as the ingenious author of observations on madness, Dr. Haslam, says it should be, only as a protecting and salutary restraint. The mode of it ought to be subject to the consideration of its effect on the mind of the insane. Some means of coercion have obviously a greater tendency than others, to irritate or degrade the feelings. Hence, the use of chains has never been permitted in the Retreat. In the most violent states of mania, as the author just quoted observes, "the patient should be kept alone, in a dark* and quiet room; so that he may not be affected by the stimulus of light or sound; such abstraction more readily disposing to sleep. As, in this violent state, there is a strong propensity to associate ideas, it is particularly important to prevent the accession of such as might be admitted through the medium of the senses." The patients of this class, who are not disposed to injure themselves, are merely confined by the strait-waistcoat, and left to walk about the room, or lie down on the bed at pleasure. But in those desperate cases of melancholy, attended with tædium vitæ, in which there is a strong determination to self-destruction, it becomes necessary to confine the patient, during the night, in a recumbent posture. For this purpose the superintendant has invented a very simple apparatus, which answers

* Our superintendant prefers a gloomy, to an entirely dark apartment.

all the purposes of security; and allows the patient to turn and otherwise change his posture in bed."

"It has been suggested, that in cases of high mania, the violent excitement would be best reduced, by indulging it in the greatest practicable degree. The experience of the Retreat leads to an opposite conclusion; viz. that such a degree of restraint as would not be materially painful, in a state of calmness, has a tendency to abate the paroxysm. The association between mental and bodily action, and the degree in which the latter is well known to excite the former, sufficiently illustrate the cause of this fact."

"Except in the case of violent mania, which is far from being a frequent occurrence at the Retreat, coercion, when requisite, is considered as a necessary evil; that is, it is thought abstractedly to have a tendency to retard the cure, by opposing the influence of the moral remedies employed. It is therefore used very sparingly: and the superintendant has often assured me, that he would rather run some risk, than have recourse to restraint, where it was not absolutely necessary; except in those cases where it was likely to have a salutary moral tendency."

On the subject of employment we find the following remarks.

"As indolence has a natural tendency to weaken the mind, and induce ennui and discontent, every kind of rational and innocent employment is encouraged. The attendant will soon perceive what kind of employment or amusement is best adapted to the different patients under his care. He will observe, that those of the most active and exciting kind will be best adapted to the melancholic class, where they can be induced to engage in them; and that the more sedentary employments are generally preferable for the maniacal class. Any branch of knowledge, with which the patient has been previously acquainted, may be resumed with greater ease; and his disposition to pursue it will be encouraged by the competency which he is able to exhibit."

"I met with a striking instance of the advantage of attention to this point, some years ago. It was related to me by a person of great respectability, who was himself the subject of the case. He stated, that a few years before that time, his mind had been

greatly depressed without any apparent cause. The most dismal thoughts continually haunted his mind; and he found the greatest difficulty in confining his attention, for the shortest time, to one subject. He felt entirely indifferent to his business and his family: and, of course, he neglected them. It was with great difficulty he was induced to take sufficient food to support life. His body became emaciated, and his mind more and more enfeebled."

"In this state, as he was one day musing upon his miserable condition, he perceived, by the faint glimmerings of remaining reason, the still worse state to which he must be reduced, if he continued to indulge his gloomy reflections and habits. Alarmed with the prospect of the future, he resolved to exert the power which he still possessed to control his unhappy dispositions, and to regain the habit of attention. For this purpose he determined immediately to apply himself to mathematics, with which he had been well acquainted in his youth, and also to adopt a more liberal regimen."

"The first attempt to go through the easiest problem, cost him indescribable labor and pain. But he persisted in the endeavour; the difficulty of fixing his attention gradually lessened; he overcame his tendency to abstinence, and very shortly recovered the use of his faculties and his former temper of mind."

"Perhaps few persons, in the situation which I have described, would have had the courage to form such resolutions; and still fewer, the fortitude to perform them. The case, however, certainly points out what may possibly be done; and how important it is, in a curative point of view, to encourage the patient in steady mental pursuit."

We shall conclude this interesting article, with the comparative account of the result of the treatment of the insane, in different institutions.

"It appears, that, from the opening of this institution, in the year 1796, to the end of the year 1811, one hundred and forty-nine patients have been admitted. Of this number only sixty-one have been recent cases. Thirty-one patients have laboured under mania; of whom,

2 have died,
6 remain in the house,
21 have been discharged perfectly recovered, and
2 so much improved as not to require further confinement.

The old, or what are usually termed, incurable cases, which have been admitted, consist of sixty-one of the maniacal, twenty-one of the melancholic class, and six cases of dementia.

Of the former,
11 have died,
31 remain in the house,
5 have been removed by their friends, improved,
10 have been discharged perfectly recovered, and
4 so much improved, as not to require further confinement.

Of the twenty-one melancholics,
6 have died,
6 remain in the house,
1 has been removed by the friends of the patient, somewhat improved,
6 have been discharged perfectly recovered, and
2 so much improved, as not to require further confinement.

Of the six cases of dementia,
2 have died,
2 have been discharged as not suitable objects, and
2 remain in the house."

"The present master of St. Luke's Hospital, stated, in the year 1807, before a select committee of the House of Commons, on "the State of Lunatics," that the average number of curable patients, admitted annually, is as follows: Males, 110. Females 153. Total 263. The number discharged are as follows: Cured, males 37. Females 71. Total 108. Uncured, males and females 100. Unfit from various causes, 28. Dead, 27."

"Dr. Haslam, the apothecary to Bethlem Hospital, states, that in the period of ten years, from 1784 to 1794, 1664 patients were admitted; of whom 574 were discharged cured, and 1090 uncured. It appears also, from the same authority, that, "in the course of the last twenty years, seventy-eight patients," who had been ill more than twelve months, have been received, of whom only one has been discharged cured.

This patient, who was a woman, has since relapsed twice, and was ultimately sent from the hospital uncured."

"The same author informs us, that "patients who are in a furious state, recover in a larger proportion than those who are melancholic. An hundred violent, and the same number of melancholic cases, were selected: of the former, sixty-two were discharged well; of the latter, only twenty-seven. Subsequent experience has confirmed this fact."

"We learn from an interesting paper, by Dr. Pinel, in the Journal de Physique, that in the hospital de la Salpêtriere in France, 1002 patients were admitted, in three years and nine months; of whom 473 were discharged, cured. It is proper to state, that of the 1002 patients, 388 had been previously under care in other hospitals; and it does not appear certain that the rest were all of them recent cases."

Elements of Physiology; by A. RICHERAND, Professor of the Faculty of Medicine of Paris, Surgeon in Chief of the Hospital of St. Louis, Member of the Academies of Vienna, Petersburgh, Madrid, Turin, &c. From the fifth London edition, revised, corrected, and enlarged.—Γνῶθι σεαυτον.—Translated from the French, by G. J. M. De Lys, M.D. Member of the Royal College of Surgeons in London. *With Notes*, by N. CHAPMAN, M.D. Professor of the Materia Medica in the University of Pennsylvania.—Philadelphia: published by Thomas Dobson. 1 vol. 8vo. pp. 609.

No branch of knowledge is more interesting than the science which explains the functions of animated beings. The physician must possess very inadequate conceptions respecting the nature of diseases, who has not previously acquired some acquaintance with the healthy actions of our bodies. Hence, the phenomena of life have ever engaged the attention of the more enlightened professors of the healing art. Though many of the minute, yet essential operations of the animated machine still remain unexplained, we believe it will be readily conceded, that physiology has made rapid advances of late

years. This improvement has been the result of careful observation, and of diligent investigation by experiment, the history of which has been recorded in the various periodical works of the last thirty years. To search these records is a task too tedious and too laborious, for those who are not solicitous about details, but who wish to be informed of general results. An elementary treatise, containing the amount of what has been ascertained, together with the conclusions which may be fairly drawn from authenticated observations and experiments, will prove at this period a very acceptable work. Surrounded by characters deeply engaged in physiological inquiries, himself long known as a teacher of the science, Richerand must be deemed fully qualified for the task. The American edition has been enlarged with notes; some intended to confirm the doctrines laid down by the author, others proposed as grounds for the editor's dissent; presented, as we think, with candour and intelligence.

In the language of the author, "every animal may be considered, in extreme abstraction, as a nutritive tube, open at the extremities;* the whole existence of the polypus seems reduced to the act of nutrition, as its entire substance is employed in the formation of an alimentary tube, of which the soft parietes, extremely sensible and contractile, are busied in appropriating to themselves, by a sort of absorption, the substances which are brought into it. From the worm up to man, the alimentary canal is a long tube, open at the extremities; at first, only of the length of the body of the animal, not bent at all in passing from the head to the tail, and carried on towards the mouth, and towards the anus, with the external covering of the body, but soon returning upon itself, and stretching out into length, far beyond that of the body which contains it."

"It is in the thickness of the parietes of this animated tube, betwixt the mucous membrane that lines it inwardly, and the skin with which this membrane is continuous, that all the or-

* "*Lacépéde*, Histoire Naturelle des Poissons, tom. 1. There may be brought, against this principle, the instance of some zoophytes, such as spunges, &c.; but do these bodies really belong to the animal kingdom? and should not we be warranted in rejecting them, by the want of the alimentary cavity, the essential characteristic of animal existence?"

gans are placed, which serve for the transmission and elaboration of fluids, together with the nerves, the muscles, in short, all that serves for the carrying on of life. As we rise, from the white-blooded animals, to the red and cold-blooded, from these to the warm-blooded, and from these to man, we see a progressive multiplication of the organs that are contained within the thickness of the parietes of the canal:—if we follow, on the other hand, the descending scale, we see this structure gradually simplified, till we arrive at last at the polypus, and find in it only the essential part of animal existence. The simplicity of its organization is such, that it may be turned inside out, and the external be made the internal surface; the phenomena of nutrition, which are the whole life of the animal, go on, from the close analogy between the two surfaces; unlike to man and the greater part of the animals, in whom the skin and mucous membranes, though growing into each other, though linked by close sympathies, are far from possessing a complete analogy of structure, or a capacity for the interchange of functions."

"Man, then, and the whole animal kind, carry about within themselves, the supply of their subsistence, and absorption, by an inward surface, is their distinguished characteristic. It is inaccurate to ascribe to Boerhaave, the comparison of the digestive system of animals, to the soil in which plants suck up the juices that feed them, and the chylous vessels, to real internal roots. I find the same thought well expressed in the work on humours, which, justly or falsely, bears the name of Hippocrates. *Quemadmodum terræ arboribus, ita animalibus ventriculus.*"

"The digestive tube, that essential part of every animal, is the part of which the existence and action are the most independent of the concurrence of the other organs, and to which the properties of life seem to adhere, if one may say so, with most force. Haller,* who has made so many and such interesting inquiries into the contractile power of the muscular organs, examining them under the two-fold relation of their irritability, as it is more or less lively, or more or less lasting,

* *Opera minora*, 3 vol. 4to.

looks on the heart as the one in which these two conditions are found in the highest combination. He gives the second place to the intestines, the stomach, the bladder, the uterus, and the diaphragm, and, after these, all the muscles under the command of the will. I had at first admitted, with every other writer, this classification of the contractile parts; but more than an hundred experiments on living animals have satisfied me, that the intestines are always the last part in which the traces of life may be discovered. Whatever may be the sort of death by which they are destroyed, peristaltic motions, and undulations, are still continued in this canal, while the heart has already ceased to beat, and the rest of the body is all an inanimate mass. M. Jurine had already observed on the pulex monoculus, that, of all the parts of the body of this little white-blooded animal, the intestines were the last to die."

"If the intestinal tube be the *ultimum moriens*, if it be the last organ in which life lingers and goes out, it is to it we ought to direct, in preference, the stimulants that are capable of recalling it in case of asphyxia. I think that, after the blowing of pure air into the lungs, the means that ought next to be attended to, is the injection of acrid and irritating clysters, thrown in with force. The large intestines are connected with the diaphragm by a close sympathy, as is proved by the phenomena of fæcal evacuation: the irritation of them is the surest means of accelerating it; and this irritation is the easier, as the alimentary canal is the last part that is forsaken by life."

Having taken this view, digestion naturally occupies the first place in the treatise, and here we shall introduce the words of the author.

"It is now pretty generally admitted, that digestion in the stomach, consists in the solution of the food in the gastric juice. This powerful solvent penetrates, in every direction, the alimentary mass, removes from one another, or divides its molecules, combines with it, alters its inward composition, and imparts to it qualities very different from those which it possessed before the mixture. If, in fact, a mouthful of wine or of food is rejected, a few minutes after being swallowed, the smell, the flavour, all the sensible and chemical qualities of such substances, are so completely altered, that they can

scarcely be recognized; the vinous substances turned, to a certain degree, sour, are no longer capable of the acetous fermentation. The energy of the solvent power of the gastric juice, perhaps over-rated by some physiologists, is sufficient to dissolve and to reduce into a pulp, the hardest bones on which some animals feed. It is highly probable, that its chemical composition varies at different times; that it is acid, alkaline or saponaceous, according to the nature of the food. Although the gastric juice be the most powerful agent of digestion, its solvent power requires to be aided by several secondary causes, as warmth, which seems to increase, and in a manner, to concentrate itself in the epigastric region, as long as the stomach is engaged in digestion; a sort of inward fermentation which cannot be, strictly speaking, compared to the decomposition which substances subject to putrefaction and acescency undergo. The gentle and peristaltic action of the muscular fibres of the stomach, which press, in every direction, on the alimentary substance, performs on it a slight trituration, while the moisture of the stomach softens and macerates the food, before it is dissolved; one might therefore say, that the process of digestion is at once chemical, mechanical, and vital; in that case, the authors of the theories that have been broached, have been wrong, only in ascribing to one cause, such as heat, fermentation, putrefaction, trituration, maceration, and the action of the gastric juice, a process which is the result of a concurrence of these causes united."

"The food remains in the stomach, during a longer or shorter space of time, according as, by its nature, it yields more or less readily to the changes which it has to undergo. Gosse of Geneva, ascertained, by experiments performed on himself, that the animal and vegetable fibre, concrete albumen, white and tendinous parts, paste containing fat or butter, substances which have either not undergone fermentation, or which do not readily undergo that process, remain longer in the stomach, and offer more resistance to the gastric juice, than the gelatinous parts of animals or vegetables, fermented bread, &c.; that the latter required but an hour for their com-

plete solution, while the former were scarcely dissolved at the end of several hours."

"XXI. The following case throws, I think, some light on the mechanism and importance of the action of the stomach in digestion. The patient was a woman whom I had frequent opportunities of examining at the "Hôpital de la Charitè" at Paris, in the clinical wards of Professor Corvisart, in which she died on the ninth Nivose of the year X. after six months' stay in the hospital."

"A fistulous opening of an oval form, an inch and an half in length, and upwards of an inch in breadth, situated at the lower part of the chest, at the upper and left side of the epigastric region, afforded an opportunity of viewing the inner part of the stomach, which, when empty of food, appeared of a vermilion colour, was covered with mucus, its surface wrinkled over with folds about half an inch deep, and enabled one to distinguish the vermicular undulations of these folds, and of all the parts which were in sight. The patient, who was then forty-seven years of age, had had this fistula since she was in her thirty-eighth year. Eighteen years before, she had fallen on the threshold of a door, and the blow had struck against her epigastric region. The place remained affected with pain, and she became incapable of walking or of sitting, otherwise than bent forward and to the left side. At the end of this long interval, a phlegmonous and oblong tumour appeared on the injured spot; during the nausea and vomiting which came on afterwards, the tumour broke and there escaped at the wound, which was left by this rupture, two pints of a fluid which the patient had just swallowed to obtain relief. From that time, the fistula, which at first would scarcely have admitted the tip of the little finger, increased daily; at first it allowed only the fluids to pass, but, on the eighth day, the solid food came away freely, and continued to do so till she died. When admitted into the hospital, she ate as much as three women of her age, she voided about a pint of urine and went to stool only once in three days. Her fæces were yellowish, dry, rounded, and weighed more than a pound. Her pulse was very feeble and extremely slow, its pulsation scarcely exceeding forty-five or forty-six beats in a minute. Three or

four hours after a meal, an irresistible desire obliged her to take off the lint and compresses with which she covered the fistulous opening, and to give vent to the food which her stomach might happen to contain; it came out rapidly, and there escaped at the same time, and with a noise, a certain quantity of gases. The food thus evacuated, exhaled an insipid smell, was neither acid nor alkaline, for, the chymous and grayish coloured pulp into which they were reduced, when suspended in a certain quantity of distilled water, did not affect vegetable blues. The digestion of the food was far from being always complete; sometimes, however, the smell of wine could not be recognized, and the bread formed a viscid, thick and soft substance, pretty similar to fibrine newly precipitated by the acetous acid, and it floated in a tenacious liquid of the colour of common broth."

"It follows from the experiments performed at the Ecole de Médicine, on these half digested substances, and on the same before their admission into the stomach, that the changes which they undergo, consist in the increase of gelatine, in the formation of a substance which has the appearance of fibrine, without having all its qualities, in a greater proportion of muriate and phosphate of soda, as well as of phosphate of lime."

"This patient was unable to sleep, till she had emptied her stomach, which she cleared by swallowing a pint of infusion of chamomile. In the morning, there was seen in the empty stomach, a small quantity of a ropy frothy fluid, like saliva. It did not turn vegetable blues to a green or red colour, was not homogeneous, but exhibited particles of some degree of consistence, among the more fluid parts, and even albuminous flakes completely opaque. The experiments performed on this fluid, showed that it bore a considerable analogy to saliva, which, however, is rather more liable to putrefaction."

"The vermicular motion by which the stomach cleared itself of its contents, took place in two different, but not in opposite directions; the one pressing the food towards the fistulous opening, the other towards the pylorus, through which the smaller quantity was allowed to pass."

"On opening the body, it was found, that the fistula extended from the cartilage of the seventh left rib, as high as the osseous termination of the sixth; its edges were rounded, and from three to four lines in thickness; they were covered with a thin moist skin, of a red colour, and similar to that of the lips. The peritoneal coat of the stomach adhered so firmly to the peritoneum lining the fore part of the abdomen, around the opening, that the line of adhesion would not be observed. The opening was in the anterior part of the stomach, at the union of the two-thirds on the left side, with the third on the right of that viscus; that is, about eight fingers' breadths from its greater extremity, and only four from the pylorus. It extended from the greater to the lesser curvature. In other respects, it was the only organic affection of that viscus."

"It should be stated, that for several years, the patient had been thin and emaciated, and had led a languid life, which was terminated by a colliquative diarrhœa. She seemed to be supported only by the small quantity of food which passed through the pylorus, into the duodenum, where it received the influence of the bile, whose action on the chyme is, as we shall presently state, absolutely essential to the separation of the nutritious parts. Not that there was any thing to prevent the absorbents of the stomach from taking up a certain quantity of nutritious particles, but that small quantity of food, in an imperfect condition, was of very little service in imparting nourishment, and, in that respect, she was in similar circumstances to patients who are affected with obstruction of the pylorus, and reject the greater part of their food, when, digestion being over, this contracted opening can no longer allow any food to pass."*

The second chapter is on absorption; from which we shall venture to present the following extract, as affording a curious

* "Cases, in many respects, similar to the above, are recorded by different writers.

"Haller, in his "Chirurgical Dissertations," has the history of a woman with an aperture in her stomach, through which she was nourished for *twenty-seven years*. For other instances of fistulous openings in this viscus, consult the "Irish Transactions," and "Medical Facts and Observations." —Ed."

speculation in pathology. "The absorbents differ, likewise, from the bloodvessels, in their singularly tortuous course, their frequent communications, and especially in their unequal size in different parts of their extent. An absorbent of very small dimensions, frequently enlarges, so as to equal in size the thoracic duct, then contracts, and again bulges out, though in the length of the vessel in which these differences of size may have been noticed, it may have received no collateral branches. The lymphatics, when completely filled with quicksilver, appear to cover the whole surface of our organs: and the whole body seems enveloped in a net-work of close and small meshes. The metastasis of humours, from one part of the body to another at a distance, is easily understood by any one who has seen those numerous inosculations rendered manifest by injection. Metastasis ceases to be an inexplicable phenomenon; one has no difficulty in conceiving how, by means of the lymphatics, all the parts of the body communicate freely; how, fluids absorbed by those vessels in one part, may be conveyed into another, and pervade the whole body, without following the circuitous route of the circulation, and that it is, therefore, not altogether impossible, however improbable, that fluids taken into the stomach, may be conveyed directly from the stomach to the bladder, and that, in the same manner, the milk of the intestinal canal may find its way into the breasts; and that pus may be removed from the place in which it is collected, and be conveyed to the place to which irritation calls it forth. All that Bordeu has said of the oscillations and currents of humours, through the cellular texture, in his "*Recherches sur le Tissu muqueux*," may be equally explained by the anastomosis of the lymphatics."

"A young man whom I had ordered to rub in mercury along the inner part of his left leg and thigh, for the cure of a pretty large bubo, was affected, on the third day, with salivation, though he used only half a dram of ointment at each friction. The salivary glands of the left side were alone swollen, the left side of the tongue was covered with aphthæ, and the right side of the body remained unaffected by the mercurial action; a clear proof, that the mercury had been carried to the mouth, along the left side of the body, without entering into the course

of the circulation, and perhaps, without passing through any of the conglobate glands; for, that of the left groin, which alone was swollen, did not sensibly diminish in size. Salivation may, therefore, take place in the cure of venereal disease, though none of the mercury enter the circulation; which warrants the opinion, that the action of syphilis, as well as of the remedies which are administered for its removal, operates chiefly on the lymphatic system."

In the third chapter, which is on the circulation, our attention was arrested by the following observation and experiment, which having a relation to the nature and cause of aneurism, we deem any apology for the insertion as unnecessary. "Of the three coats which form the parietes of the arteries, the fibrous, though thicker than the other two, offers, however, the least resistance. If you take the carotid artery, which, for a considerable space, does not send off any branches, and forcibly inject into it a fluid, the internal and middle coat will be torn, before dilatation has increased, by one half, the caliber of the vessel. The external coat resists the cause of rupture by dilating, and forms a tumour, and it is only by applying a pretty considerable force, that it can be ruptured. The experiment is attended with the same success, if performed with air or any other gas. In aneurism, the internal and fibrous coats of the arteries, but more particularly the fibrous, are ruptured at an early stage of the disease, which at that period increases suddenly, in a very rapid manner; and on opening the tumour, it is observed, that the sac is entirely formed by the dilated cellular coat. Take an artery of a certain caliber, for example, the carotid or humeral, apply a ligature around it and tighten it with some degree of force. Dissect and take out the vessel, then cut the thread, and examine the place to which it was applied; you will observe, that the parietes of the artery are in that part thinner, and formed merely by the cellular coat, which alone has withstood the constriction. Take hold of the two ends of an insulated arterial tube and stretch it, then examine its inner coat, and you will find it torn and cracked in several places, and the parietes of the artery evidently weakened."

"This want of extensibility in the coats of arteries, is the principal cause of aneurism; hence the popliteal artery is so liable to that affection, from its situation behind the knee, whose extension is limited merely by the resistance of the posterior tendons and ligaments; this artery is affected by the jar which takes place through all the soft parts, when the leg is violently extended; and being less extensible than the other parts, its inner coat is ruptured, or at least weakened, so as to occasion an aneurism, always rapid in its progress. Of ten popliteal aneurisms which I have seen in different hospitals, eight were ascribed to a violent extension of the ham. In looking over the cases that have been recorded, it will be seen, that a considerable number of aneurisms of the aorta have been occasioned by too forcible and too sudden an extension of the trunk in raising a heavy burthen."

The author has assigned to the vena azygos, an use which appears to us novel; it is as follows. "As the inferior vena cava passes through the lower edge of the liver, whether along a deep fissure, or in a real canal in the parenchymatous substance of that viscus, the course of the blood must be impeded, when, from congestion of the parenchyma, the vessel is, in some sort, strangulated."

"Obstruction of the liver, which is of such frequent occurrence, would be attended with fatal consequences, by preventing the return of the blood from the inferior parts, along the ascending cava, if this great venous trunk did not keep up, by means of the vena azygos, an open and free communication with the descending or superior cava. The use of this anastomosis of the two great veins is, evidently, to facilitate the passage of the blood from the one of these vessels into the other, when either, especially the lower, does not readily evacuate its contents into the right auricle. On this account, the vena azygos is capable of considerable dilatation, and is entirely without valves. In the body of a man opened this day in my presence, and whose liver was twice as large as in health, I observed, that the vena azygos, which was distended with blood, was of the size of the little finger; the termination downward of this vessel, in the right renal vein, and above in the superior cava, were most distinct, and by compressing it

from above downward, or from below upward, the blood flowed into the one or other of these vessels."

Respiration, secretion, and nutrition occupy the three succeeding chapters, which concludes the functions which are subservient to the preservation of the individual, by assimilating to his substance the food by which he is nourished.

The functions which tend to the preservation of the individual by establishing his relations with the beings that surround him, comprehending sensation, motion, voice and speech, are next considered by the author. Afterwards he takes a view of the functions subservient to the preservation of the species. The work closes with a chapter containing the history of the ages, the temperaments, and the varieties of the human species, of death and putrefaction. But this analysis has already been extended to considerable length; to those who would enter more fully into its merits, we must recommend the perusal of the work.

Elements of Surgery, for the use of Students, with plates. By John Syng Dorsey, M.D. Adjunct Professor of Surgery in the University of Pennsylvania, one of the Surgeons of the Pennsylvania Hospital, &c. in two vols. 8vo.—Motto,

> ——— for want of timely care,
> Millions have died of medicable wounds. Armstrong.

Philadelphia, published by Edward Parker, and Kimber & Conrad, 1813.

It affords us, at all times, pleasure to announce the publications from the American press. When they can, in any degree, be considered as the labours of our countrymen, we have a greater pride and satisfaction in presenting an analysis to our readers. The claims of the present author cannot be better expressed than in the following words, taken from his preface. "I take the opportunity of disclaiming, except in a few instances, all pretensions to originality. I have availed myself freely of the writings of preceding authors, and my extracts are, in many instances, of very unusual length. The only apo-

logy I shall offer for this liberty, is, that I have considered it the more useful and honest method of communicating information. Having made this acknowledgment, I shall now state, that I believe there will be found in the following work, many observations of practical importance, which are not contained in any other. These, I principally owe to my connexion with Dr. Physick, and a careful attention to his practice during a period of fifteen years."

"In the succeeding pages, my chief attention has been directed to practical precepts, and these I have endeavoured to deliver with clearness; I am not without a hope, that they will prove not only useful to medical students, but also to country practitioners, and to the younger surgeons in the navy and army."

The work is introduced with some observations on inflammation and simple incised wounds; short and concise, yet containing such general aphorisms as are requisite to guide the practitioner in their treatment. In explaining the nature, symptoms, and treatment of fractures and dislocations, the author has availed himself of the labours of Desault, and Boyer, particularly of the latter, from whom he has made copious extracts. They are judicious, and unquestionably from good authority. When treating of injuries of the head, the author has presented the following observations, which appear to us interesting, and not generally known.

"In addition to the usual effects of blows, in which the scalp is chiefly concerned, a severe pain sometimes remains for a great length of time after the accident. I know of no remedy for this terrible complaint, which happily is of rare occurrence, but which in severity and obstinacy is surpassed by no local pain. Coldbathing, sea-bathing, mercury, copious bleedings, blisters, issues, purging, emetics, all the narcotics, and numerous other remedies, have been used in some instances, without any effect. The incision down to the bone should be tried, as it has in some cases produced immediate relief."

The history of the symptoms attendant on concussions of the brain, and on fractures of the skull, is chiefly drawn from Abernethy and Pott. The author has, however, shown, that he has been a careful observer, and in addition to the causes

of hernia cerebri hitherto announced, he has, in our opinion, very correctly stated, that this protrusion may be occasioned by the pressure of contained pus.

The operation of trepanning is described in very clear and concise terms, and evince, that the author might, if he had not been directed by other views, with success have engaged in writing from his own knowledge, instead of compiling from the works of others.

The various diseases of the eye, occupy the next place in the work. The author has ranged himself with the advocates for the extraction of cataract, in preference to couching. The arguments he has adduced, are drawn from Wenzel, and have been repeatedly before the public. Scarpa and Hey, no mean authorities, have not hesitated to prefer depression. Accordingly, the author has, with great propriety, given a description of both operations, taken from Wenzel and Scarpa, respectively.

The following mode of operating for umbilical hernia, appears to possess some peculiar advantages, as it affords the operator an opportunity of making a full examination of the protruded viscera by a free opening of the sac, and the danger of peritoneal inflammation, from this opening, is precluded by the ligature which occasions the closure of the neck of the sac, and prevents the exposure of the abdominal viscera. It has been proposed by Dr. Physick, though never performed by him. Dr. Wistar, the author states, has performed it with complete success.

The operation "consists in making a crucial incision through the integuments of the tumour, and dissecting the four angles thus formed down to the neck of the sac; an opening is next to be made into the sac at its upper part, of a sufficient size to afford a view of its contents; should these be sound, they are to be reduced if practicable, without dilating the umbilical aperture; but if this cannot be done, that aperture is to be enlarged outside of the sac. When the contents of the sac are reduced, a ligature is to be tied round its neck."

When describing the different modes recommended for the cure of stricture of the urethra, we think the author of the Elements has not been historically correct in considering Mr.

Hunter as the first who suggested the application of caustic for this purpose. It was unquestionably practised in the sixteenth century, as may be ascertained by a reference to Saviard's Surgery. The operation had probably been unskilfully performed on some occasions, as Saviard does not hesitate to give it his decided disapprobation. At this moment we have no opportunity of ascertaining the exact process adopted at the period alluded to.

Ambrose Paré, who was surgeon to Henry the IVth of France, about an hundred years before the foundation of Philadelphia, has given, in a work published by him, representations of instruments employed for the division of strictures, at that time termed caruncles in the urethra. The engravings are very rudely executed, and the instruments may have been but badly fashioned. Whatever improvements in the form of the instrument have been suggested by Dr. Physick, who has probably overlooked the claims of Ambrose Paré, the merits of the invention must be ascribed to the French surgeon.

In the operation for lithotomy, the advantages of Dr. Physick's improved gorget will readily be admitted by every one who has occasion to operate for stone in the bladder; and a plate, with a minute description of the instrument, are with great propriety given in the Elements of Surgery.

The operation of tying the artery, as proposed by Mr. Hunter, for the cure of aneurism, with the successive improvements suggested by Messrs. Abernethy and Henry Cline, has been performed on this side of the Atlantic. In our number for October, 1811, we published a case of inguinal aneurism, successfully treated by tying the internal iliac artery above Poupart's ligament. We were favoured with this history by Dr. Dorsey, by whom the operation was performed. Besides this case, the author has introduced into his Elements of Surgery, "a case in which the carotid artery was tied up successfully, by Dr. Post, of New York, a gentleman long distinguished as one of our ablest surgeons." They are both happy specimens of surgical skill, and would reflect honour on the profession, wherever surgery is the most successfully cultivated.

The author of the Elements mentions, "that a remedy for spina bifida is still to be considered a desideratum." In the 12th number of the Eclectic Repertory, we gave some cases of spina bifida, drawn up by Mr. Astley Cooper. One was radically cured by puncturing the tumour with a needle, and then subjecting it to pressure by means of a flannel roller. Should this operation fail of success, Mr. Cooper proposes the application of a suitable truss to support the integuments, and thereby prevent the rupture of the tumour always attended with fatal consequences.

Before we close this review, we cannot pass unnoticed, the engravings designed and executed by Dr. Dorsey, in a style which does credit to his taste, and skill in the graphic art. To those who have not a ready access to medical libraries, we recommend the Elements of Surgery as a valuable compendium of the most approved practice in that branch of the healing art.

A Dissertation on the Natural History and medicinal effects of the Secale Cornutum, or Ergot. By OLIVER PRESCOTT, A. M. 8vo Pamphlet, pages 16.

THE sufferings attendant on parturition, have, in every period, excited the liveliest sympathy. Whatever can tend to alleviate these sufferings, or contribute to accomplish this important process, by renewing the powers of the uterus, when its contractions have ceased, can not fail of being cordially received by the profession. Impressed with these sentiments, we venture to lay before our readers, a copious extract from this pamphlet, presenting entire the observations which the author has collected respecting the medicinal virtues of the ergot or secale cornutum.

"Some few empirics, however, it is said, have long known that the ergot would expedite lingering labour. But these ignorant pretenders bestow upon their nostrums so extravagant encomiums, and their impositions upon the credulity of the pub-

lic are so numerous and frequent, that no credit whatever can be attached to their recommendations. Most of their mighty secrets, when disclosed, prove altogether inert; or at best very incompetent to effect the purposes for which they are intended. Their powder, to promote delivery, was consequently derided, and was thought by the faculty to be unworthy of serious attention or regard.

"The first information the public received, from a source entitled to credence, that this production was, in reality, endued with such unexampled property, was through the medium of the New York Medical Repository,* by a letter from Dr. J. Stearns to Dr. Akerly. In this communication, Dr. Stearns designates it by the appellation of *pulvis parturiens*.

"Very soon after this publication, I procured a sufficient quantity for experiment, and have since frequently used it. With very few exceptions, its uniform effect is to stimulate the uterus to increased action, when administered in parturition. But I cannot say with Dr. Stearns, "I have never been disappointed in my expectations of its effects;" for I met this disappointment in the very first case in which I prescribed it. In that case, a neighbouring physician was attending the patient, the travail had progressed slowly, but in a regular manner, until the head of the fœtus was detruded so low in the pelvis, that the ear was perceptible to the touch, when the pains subsided, and had entirely ceased, some hours before I was summoned. One drachm was administered, in the form of decoction, at three separate doses, but without producing any effect, when the delivery was accomplished by the aid of the *forceps*.

"Two similar cases have since occurred, in which the pains had totally ceased, toward the termination of labour, and in which parturient efforts could not be revived, by any quantity I thought prudent to administer. In one of these last, the patient took the decoction of more than two drachms in divided doses.

"In four other patients, I had reason to doubt whether the pains were increased by its use, either in frequency or strength;

* Vol. ii. p. 308.

but one dose only was given to either of them, for the irritable state of the stomach prevented its being repeated.

"In every other instance, without exception, the effects of this prescription have been such as fully to demonstrate its powers "*ad partum accelerandum.*" The pains produced by it, when a full dose is given, are very peculiarly forcing, and the contractile effort of the uterus continues to that degree, that the fœtus is not suffered to retreat, but remains firmly retained where the last exacerbation of pain left it, until it recurs again. This incessant action will continue, if the delivery is not effected, for an hour or more; and when it subsides, the medicine, again given, will reproduce the same effects.

"The frequency and violence of the uterine efforts, induced by the ergot, are not more extraordinary, than is its almost instantaneous operation. In twenty cases, I carefully noticed the precise time it required, to produce its customary effects. In two of them, the increased strength of the pains, and the continued action commenced in seven minutes from the time the decoction was taken; in one case it was eight minutes, in seven it was ten, in three, eleven, and in three others it was fifteen minutes. In the four remaining cases, there was no apparent operation until twenty minutes had expired. In other cases, the time was not particularly noticed; but as the twenty I have given were nearly in succession, it is probable they will show the proportion, as accurately, as if the time in all had been precisely ascertained.

"From this account of the manner in which the ergot usually operates, it will be readily conceived, by those who have not witnessed its effects, that it is a powerful agent, which requires prudent direction; but when properly applied, will be highly useful, many times, to shorten a process, which, unaided, would prove extremely tedious and troublesome.

"Before I had acquired sufficient experience of its effects, I imprudently used it once or twice when the pains were tardy and feeble, even in first labour, before the orifice of the uterus was much relaxed or dilated; it having been recommended to "produce all the beneficial effects of bleeding without inducing the debility." But it does *not* usually prove relaxing to the rigid fibre; its operation, therefore, subjected the patients to

much unnecessary suffering. In one instance, no perceptible progress was made, by the continuance of forcible uterine efforts, during the space of an hour.

"It is therefore important, even if the pains are feeble and unfrequent, to delay giving this stimulating drug, until considerable dilatation has taken place; to leave the business in its early stages to the slow and regular process of nature; and by the respite thus gained by the intervals from pain, preserve the strength and resolution of the patient for later and more painful efforts.

"But if the labour should be long protracted, from the irregular action of the uterus, or the rigidity of the muscular fibres, these obstacles should be first removed by venesection; after which the ergot may be usefully employed, and its operation will be found mild and efficacious. But whenever recourse is had to venesection, the depletion should be copious, and the blood suddenly drawn from a large orifice; for no possible advantage will be gained by this operation, upon a plethoric subject, if the quantity taken be less than twenty ounces; and I have repeatedly taken thirty, before the necessary end could be accomplished.

"I have never administered ergot in substance, but always in the form of decoction, in the proportion of half a drachm to four ounces of water, of which one third is taken at a time; if the pains are not sufficiently augmented in twenty minutes, then half the remainder is given; but a second dose is rarely required.

"It will probably be found more beneficial in many cases to diminish the quantity to one large table spoonful, which, taken every ten minutes, will have the effect to increase the vigour of the pains, without producing such excessive and constant action, as is usual when the full dose is administered. I have lately directed it in this manner, and have been so much gratified with its more temperate, though efficient action, that I shall hereafter prefer the smaller to the larger quantity.

"It has been suggested, by a writer in the New England Journal of Medicine and Surgery, that the death of the infant is a more frequent occurrence, in cases in which the ergot has been employed, than where its agency has not been used. If

this is indeed the case, it forms at once an insuperable objection to its use, except in cases where its safety is well defined; and the subject certainly demands deliberate attention and serious inquiry. For myself, it is, I conceive, rather questionable, whether more injury would result to the child "from unceasing pressure for several minutes, and occasionally for half an hour or more," than for a much more tedious process, in which the pressure is reiterated, and the head permitted to retreat after each successive effort. But, in a matter of such importance, we ought not to be governed by conjecture; but should adopt or reject it, as its beneficial or destructive operation is tested by experiment. My own experience has been such, as to persuade me, that the above suggestion is unfounded. It is true, that in twenty-two cases of first labour, in which this medicine had any effect, I lost four children, and in thirty-five where it was given to women, who had been previously delivered, I have lost one. But all these deaths were attended with such circumstances, as fully to exculpate the ergot from any agency in the event. And when it is recollected that this medicine is not used, except in cases that are long protracted, or are likely to prove tedious and troublesome, it will not be thought, I conclude, that this unfortunate event happened more frequently, or in greater proportion to the whole number of cases, than might reasonably have been expected, had this medicine not been prescribed.—But exclusive of any injurious effects, which may result to the infant, the ergot requires much more caution with respect to its use, in cases of first labour, than in others: for, owing to the usual tension and rigidity of the parts, the protruding progress will not be accelerated, in any reasonable proportion to the additional pain and suffering it produces. It is also too active and powerful an agent, to be safely directed by an ignorant or unexperienced accoucheur; and before dismissing the subject, I most cordially join in cautioning those, who have not been in the practice of using it, and witnessing its operations, to be wary how they employ its agency, until the muscular fibre is properly relaxed, and the *os uteri* considerably dilated. This caution is also more especially necessary, if they are not positively certain that the presentation is natural, as well as "that there are

no preternatural obstructions, to prevent delivery; as the violent pain, and almost incessant action, which it frequently induces, in the uterus, precludes the possibility of turning" the fœtus.

" Dr. Beekman is said to have succeeded in a case of amenorrhœa, by giving one drachm of the ergot in decoction. In consequence of this recommendation, I tried its effects in one case of partial obstruction, by giving it, first in a dose of one drachm; at the next period the same patient took two drachms, but without the desired effect. And from analogy, I should conclude, that it was unadapted to this complaint. The tendency of its operation is, I conceive, to constringe the uterine fibres, and lessen the caliber of its bloodvessels; for, when given to parturient patients, there has been no instance, within my knowledge, of undue hemorrhage after delivery, although several, who have taken it, had been previously accustomed to profuse discharges. The lochia also, have occasionally been so much diminished, after its use, as to excite apprehension for the event. In two cases, this discharge entirely ceased, on the second or third day after delivery, and did not reappear during the month; but no puerperal complaint was induced, nor was their recovery delayed by this incident.

" The uniform operation of the ergot to restrain uterine hemorrhage, has been noticed by other physicians. It has, in consequence, frequently been prescribed, a little previous to the birth of the child, or immediately after, to patients that have been accustomed to flow immoderately, at such times, and it has always proved an effectual preventive.

"This singular property of the ergot, to diminish the enlarged cavity of the uterus, is never more strikingly exemplified, than when its agency is employed to restrain those floodings, which sometimes appear, in the early months of pregnancy, when the action of gestation has ceased, and abortion must follow. In such cases, it speedily excites, in the uterus, such energetic action, that its contents are soon expelled, and the hemorrhage ceases.

" In order to determine what operation it might have, on a healthy male subject, the decoction of one drachm has been taken at a dose; but it produced neither nausea nor other per-

ceptible effect. After a few days, the same person took a like quantity, which proved equally inert: neither did the larger quantity of two drachms, at a few doses, but all within the space of two hours, occasion nausea, vomiting, or pain in the female, to whom it was prescribed, for deficient catamenia.

"Its operative powers, therefore, appear wholly confined to the uterine fibres, when lengthened from an enlargement of that viscus. In such case it speedily excites, in them, strong contractile action, and so long as the stimulating effect of the medicine lasts, this action is unceasing. The uterus is thus made to compress closely, upon any substance whatever within its cavity, and this resistance to its further collapsing, will cause violent pain in that organ; but if it find no such resistance, the contractile action progresses without any uneasy sensations. The healthy, unimpregnated uterus, having nothing within its cavity, will therefore not be affected by the ergot; neither is it calculated to restrain menorrhagia, proceeding from increased arterial action; as the size of the uterus, in such cases, is nearly at its minimum.

"Until we clearly understand the reason, why some medicines possess a greater affinity to one part of the system, or to one organ, than to another, it will be difficult to explain the *modus operandi* of the ergot. It is, as has been already observed, but a short time, since it first attracted the notice of physicians, as being subservient to any useful purpose in medicine; and I have not yet discovered that it possesses any other properties, than such as I have mentioned. Like all other active and valuable medicines, when first made known to the public, it requires a long series of judicious and attentive experiment, fully to develop its character, its qualities, and the precise manner in which it may affect different parts of the human system. Like them, while its use is beneficial, its abuse is destructive. A cautious direction of its powers cannot, therefore, be too strongly recommended. If properly administered, it must be esteemed an important and valuable acquisition to our *materia medica;* and is unquestionably destined to hold a high rank, among the means, which kind nature has provided, for relieving the sufferings of her children."

MEDICAL AND PHILOSOPHICAL INTELLIGENCE.

Vaccine Society.

THIS Society has continued its operations—919 persons have been successfully vaccinated by the Physicians of the institution in 1813; which, added to the patients of former years, gives a total of 5508.

The Society has made some change from its original plan. The following extracts from the present constitution, will serve to show the principle on which the Society was originally formed.

"The collector of cases shall call on such persons as may be deemed suitable objects for vaccination, and report them to the Physicians; a regular account whereof shall be kept for the inspection of the managers."

"The business of the Physicians shall be to go the houses of the patients, and vaccinate them. They are to keep an account of the names, ages, places of abode, and occupations of the persons vaccinated; and, if the patient be a minor, of the parent or guardian, with the events; and report the same to the managers."

Philadelphia Dispensary.

FROM the annual Report, published by the Managers, it appears, that THREE THOUSAND, ONE HUNDRED AND TWENTY patients have been attended by the Physicians of the Institution from December 1st, 1812, to December 1st, 1813.

Patients remaining from last year,		81
Admitted since that time,		3039
Of which number the cured are,	2831	
relieved,	51	
dead,	77	
removed,	24	
irregular,	27	
remaining under care,	110	
		3120

The Institution has received, including last year's balance in the treasurer's hands,

	Dolls. 5315 19	
A balance due the treasurer this year,	20 50	
Accounts passed by the board of managers, but not paid,	110 70	
		5446 39
The expenditures have been,		5446 39

Managers elected January 1814.

William White, *President.*
Lawrence Seckel,
Robert Blackwell,
Henry Helmuth,
Robert Smith,
Robert Ralston,
Godfrey Haga,
Ebenezer Hazard,
Isaac Snowden,
Joseph Crukshank,
Elliston Perot.
Samuel P. Griffitts, *Secretary.*

Officers elected January 1814.

ATTENDING PHYSICIANS AND SURGEONS.

Doctor Henry Neill,
Samuel Stewart,
Joseph G. Shippen,
Joseph Woollens,
Joel Martin,
Abraham B. Tucker.

CONSULTING PHYSICIANS AND SURGEONS.

Doctor Thomas Parke,
Caspar Wistar,
Philip S. Physick,
Thomas C. James.

Treasurer,
John Clifford.

Apothecary,
George G. Tresse.

American Philosophical Society.

The following persons were on the 7th of January, 1814, duly elected Officers of the Society.

President,

Thomas Jefferson.

Vice-Presidents,

Caspar Wistar,
Benjamin S. Barton,
Robert Patterson.

Secretaries,

Thomas C. James,
T. T. Hewson,
Robert M. Patterson,
Reuben Hains.

Counsellors,

Thomas Cooper,
Robert Hare,
Edward Pennington,
William Meredith.

Curators,

Zaccheus Collins,
Joseph Cloud,
William Hembell, jr.

Treasurer,

John Vaughan.

METEOROLOGICAL OBSERVATIONS.

State of the weather at Philadelphia, during the last six months of 1813.

JULY.

Thermometer—Lowest, at 8 A. M. 63, 5th day of the month.
Highest, at 3 P. M. 89, 8th.
Mean, ... 70.

Winds—Westerly, the beginning—Easterly, towards the latter part of the month.

Moderate weather,—not much thunder,—frequent rains,—the harvest good, and well got in.

AUGUST.

Thermometer—Lowest, at 8 A. M. 64, 19th day of the month.
Highest, at 3 P. M. 85, 8th.
Mean . . . . 72.

Winds—Variable,—mostly westerly,—refreshing rains,—hurricanes in the West Indies, and in South Carolina and Georgia.

SEPTEMBER.

Thermometer—Lowest, at 8 A. M. 56, 7th and 30th days of the month.
Highest, at 3 P. M. 85, 13th.
Mean . . . . 62.

Winds—Westerly,—a pleasant month,—peaches and pears rather plentiful,—apples scarce,—melons in abundance.

OCTOBER.

Thermometer—Lowest, at 8 A. M. 35, 22d day of the month.
Highest, at 3 P. M. 64, 10th and 17th.
Mean, ... 50.

Much southerly winds,—cloudy weather and rain,—white frost on the 14th. A severe gale at Gottenburgh, in Sweden; many vessels lost. About the beginning of this month a severe shock of an earthquake in the island of Teneriffe.

NOVEMBER.

Thermometer—Lowest, at 8 A. M. 30, 15th and 16th of the month.

Highest, at 3 P. M. 59, 25th.

Mean, ... 41.

Winds very variable,—little rain,—Indian summer, commencing about the 6th, continued for a few days,—13th, some snow,—ice the 14th,—an heavy gale the 18th,—about the middle of the month a violent gale at Halifax, Nova Scotia—many vessels lost. Several severe shocks of earthquake in the latter end of this month, and the beginning of December in the Ilinois Territory.

DECEMBER.

Thermometer—Lowest, at 8 A. M. 26, beginning and end of the month.

Highest, at 3 P. M. 44, 7th.

Mean . . . . 32.

North westerly winds,—snow on the 20th,—ice in the river on the 21st. Two shocks of an earthquake at Russelville, Kentucky, on the 12th.

The dysentery was uncommonly prevalent in August in town and country,—frequently mortal, especially in the country. We have heard of no case of small-pox in the city during the last year.